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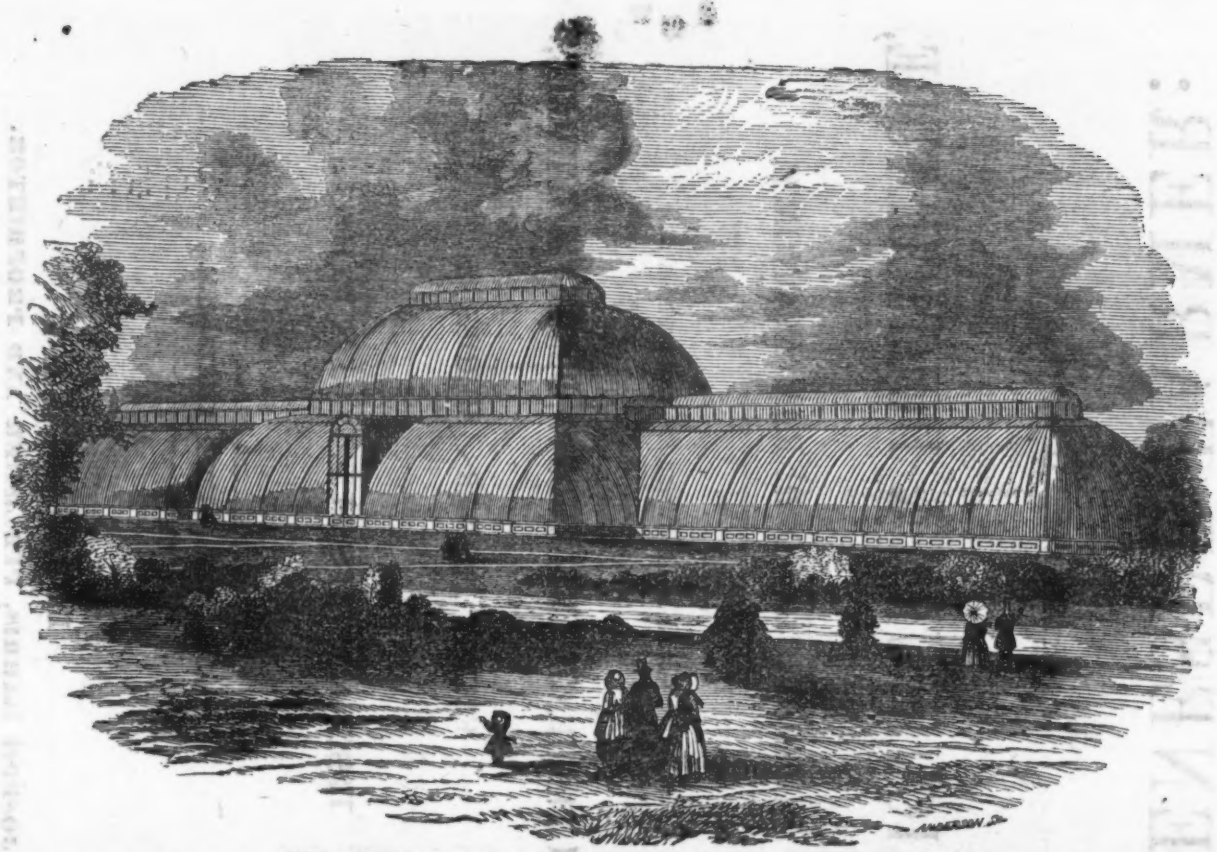

THE GREAT PALM-HOUSE, AT KEW, ENGLAND.

THE Genesee Farmer.

G. ERAUENBERGER. SC.

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J. B. LAWES AND JUSTUS VON LIEBIG.

Liebig's late pamphlet on *The Relations of Chemistry to Agriculture, and the Experiments of Mr. J. B. Lawes*, has produced considerable excitement in Germany. Dr. Wolff, Professor of Chemistry in the celebrated Hohenheim Academy of Agriculture and Forest-culture, and a man who, in the language of Mr. S. W. Johnson, of Yale College, unites "eminent scientific ability with practical knowledge," has written a masterly reply to Liebig, and enters warmly into the defence of Messrs. Lawes & Gilbert, whose scientific reputation the great advocate of the "mineral theory" has savagely assailed. This has called forth another paper from Prof. Liebig, and which has been translated by Mr. S. W. Johnson, and will be found in the *Country Gentleman* (Oct. 11–Nov. 8). The greater portion of it has only a remote bearing upon the subject under discussion. Prof. Liebig appears to avoid, as much as possible, the real issues of the question. When the result of any of Mr. Lawes' experiments throw doubt on Liebig's views, he cries out: "Must not every farmer see that conclusions founded upon experiments conducted in a manner so rough, so utterly lacking circumspection, are *utterly* valueless!" But when any of the results of these same experiments confirm any of Liebig's opinions, he tells us: "The facts which he" [Mr. Lawes] "has ascertained, teach so many important doctrines in reference to the cultivation and manuring of the soil, that I hold them to be of very special value to the theory of agriculture." And in another place he says of these "*utterly valueless*" experiments: "It must be acknowledged, what I said at first, that of all the investigations that have been made, none are so eminently adapted as his" [Mr. Lawes'] "to advance the mineral theory." "Mr. Lawes' experiments thus *demonstrate*."—"The trials of Lawes confirm this view."—"Mr. Lawes has *proved*."—"But the experiments of Mr. Lawes furnish perfectly definite and *reliable* facts relative to this subject."—"The results of Mr. Lawes demonstrate precisely."—From the result of Mr. Lawes "it is perfectly certain."—&c., &c.

To us it is "perfectly certain" that the same experiments can not be "*utterly valueless*" and of "very *special value*;" and we are quite unable to understand how "experiments conducted in a manner so rough, so utterly devoid of circumspection," can "demonstrate," or "prove," or "disprove," or render "perfectly certain" anything at all: and yet "of all the investigations that have been made, none are so eminently adapted to advance the *mineral theory*." Indeed, exclaims Liebig, in another place, "I consider them the *firmest support* of the theory." This is proving too much. The mineral theory is confessedly a deduction; and the inductive experiments which are its "firmest support" are "utterly valueless."

But to the question. As we have said, Mr Lawes found a definite increase of wheat from an application of ammonia to a soil abounding in all the mineral elements of plants. But under the most favorable circumstances he has never obtained as much nitrogen in the increase of grain and straw as was supplied to the soil in manure. He concludes from this, that in the growth of wheat there is a great loss of ammonia. Without attempting to determine the exact proportion, he states that his experiments indicate that for one pound of nitrogen (ammonia) organized in the wheat plant, five pounds are evaporated into the atmosphere, and are lost to the farm. On the other hand, his experiments with turnips, clover, beans, peas, and tares, prove that in the growth of these so-called "fallow crops" no such loss takes place. Liebig, as has been stated, took no notice of these views of Mr. Lawes, but Dr. Wolff has forced them upon his attention; and in his reply to Dr. Wolff, Liebig alludes to them as follows:

"In the writings of experienced agriculturists, I find as quite a general rule, that they do not hold a field rich in ammonia (freshly dunged) to be especially adapted for the cultivation of wheat, but recommend some other crop (potatoes) to precede wheat on such soils.

"But the experiments of Mr. Lawes furnish perfectly definite and reliable facts relative to this subject. He has found that a field which had previously received no ammonia nor ammonia-salts, can yield a medium harvest of 1125 lbs. wheat and 17.56 cwt. straw for seven years in succession, without any artificial supply of ammonia, and in the last years the yield was greater than at first.

"From this it is perfectly certain that a soil, otherwise good, will yield almost an average crop of wheat without an addition or excess of ammonia; and that, no matter what the quantity of ammonia may have been contained in the soil originally, and given up to the plant, or lost, this loss was without effect on the crops of the succeeding years.

"It is therefore allowable to pronounce the assertions of Dr. Wolff—that wheat requires for perfect development more ammonia than the soil contains in natural form; that the soil suffers a loss of ammonia

by the cultivation of wheat, becoming in consequence less fertile, are wanting all foundation in fact, because the results of Mr. LAWES demonstrate precisely the contrary. * * * The erroneous assertion of Dr. VOLFF rests originally upon the equally erroneous interpretation which Mr. LAWES has given of the fact that ammonia salts increased the yield of his wheatfield.

"While Mr. LAWES harvested 17 bushels wheat and 1½ cwt. straw from one acre of unmanured field, annually for seven years, a plot of equal size and quality, which received in the first year 5 cwt. of dissolved bones, and 2 cwt. of silicate of potash, and in the following six years 326 lbs. of ammonia salts (the average) annually, yielded 25 bushels, or a yearly increase of 8 bushels of wheat, and a corresponding larger produce of straw.

"Now, since this plot as a part of the same experimental field, would undoubtedly have grown 17 bushels without any manure, he ascribed the increase to the action of the ammonia salts without taking any account of what had been added the first year.

"Further, since in order to produce one bushel more of wheat, than the unmanured plot would have yielded, Mr. LAWES added 41½ lbs. of ammonia salt; and since one bushel of wheat contains 1.2 lbs. of nitrogen, and 42½ lbs. of ammonia salts contain 6½ lbs. of nitrogen, he harvested in the grain and straw five times less ammonia than he added to the soil. This is the fact. The false conclusion that he deduces is, that the culture of wheat is accompanied by an enormous loss of ammonia, since, at the lowest estimate, 5 lbs. of ammonia must be added to the soil in order to get one bushel of *increase* per acre.

"In order to draw a general conclusion from the observed fact, *i. e.* to be able to speak of it as a matter of settled experience, Mr. LAWES should have determined in accordance with the rules of research the general conditions which determine the production of one bushel of wheat and the corresponding amount of straw *in all cases;* as well as the special conditions which caused the increase in his experiments.

"If now it is true that 6 lbs. of ammonia were necessary to produce one bushel of *extra yield,* and that of this ammonia 5 lbs. were lost (evaporated through the plant), it must also be true that 6 lbs. of ammonia were removed from the soil of the unmanured plot, to produce every bushel of *ordinary yield,* and of this ammonia 5 lbs. also were lost to the soil by volatilization.

"Since now the unmanured plot yielded in seven years 123½ bushels of wheat, it follows that the soil must have contained, or received from the air or rains, 618½ lbs. of pure ammonia or 3850 lbs. of carbonate of ammonia (salts of hartshorn), and that in seven years this quantity of ammonia was rendered useless for future harvests by the wheat culture.

"Such a conclusion it is impossible to support by any fact. What we know with certainty is that during seven years 21½ lbs. of nitrogen were annually removed from the soil of the unmanured plot by the crop grown upon it, or 149 lbs. in total; but how much ammonia was contained in the soil, and was consumed in the production of 17½ bushels of wheat, we know nothing about.

"Since now, Mr. LAWES did not know how much ammonia the wheat plant requires from the soil in order to give one bushel of yield upon the unmanured plot, how could he know that for every bushel of increased yield (gain by manuring) precisely 6 lbs. of ammonia were necessary.

"If it had accidentally occurred to Mr. LAWES to manure his field with four, five, or six cwt. of ammonia salts, instead of with 3½ cwt., and if in those cases the yield was not increased (as we may with certainty assume would happen) then he might with the same justice assert that the loss of ammonia is 6, 8, or 10 lbs. for every bushel of increased yield.

"Or if Mr. LAWES had applied ammonia salts at the rate of 2 or 1 cwt. instead of 3½ cwt. the acre, and then, after previous manuring with dissolved bones and silicate of potash (whose action he has not taken at all into account), had harvested the same increase of 8 bushels; his conclusion that the soil suffers a loss of ammonia, would doubtless have been vastly modified. He has made the loss and not found it. The number 5, for the amount of ammonia, and the quantity 1 bushel for the increased yield, are not expressions for a natural relation between manure and crops. The first does not express the weight of ammonia necessary to produce a maximum of increase, equal to one, and ascertained by a series of observations, but is a mere stroke of fancy. It never seems to have occurred to Mr. LAWES to determine the minimum of ammonia which was effective upon his field in producing maximum crops."

The pith of the controversy lies here; and LIEBIG puts forth his whole strength. We have rarely met with a finer specimen of special pleading. It is, however, the only portion of his lengthy paper which is to the point. The case against Mr. LAWES is stated in as strong a light as possible, and no doubt many who read only one side, will be deceived by the plausible sophistries of this greatest, ablest, and, we are sorry to add, most unscrupulous of controversalists. He seems to "stick at nothing" that will help him to make out a case. Nevertheless, we are glad that Dr. WOLFF has succeeded in forcing him to attack Mr. LAWES' main position. We have given LIEBIG's whole argument, and will now briefly examine it.

It is true, as LIEBIG states, that Mr. LAWES' soil yielded 17 bushels of wheat per acre annually for seven years, without any manure; and we may add, indeed, for thirteen years. It is also true that mineral manures—the ashes of the wheat plant—alone, do not enable it to produce any larger crop. It is further true that 17 bushels "is almost an average crop of wheat." On the other hand, it is also true that where this same soil has been annually supplied with ammonia *alone*, much larger crops have been obtained—on an average of seven years, as LIEBIG admits, *half as much again;* and, we may add, last year (1854) as much as 34½ bushels per acre were obtained; and this, it must be observed, after ten successive crops had been grown (and removed from the soil) by the aid of ammonia alone. The province of Agricultural Chemistry, LIEBIG tells us, is to produce *more* grain and more meat, and not simply grain and meat which have been produced for centuries without her aid. We fully agree to this; the object of agriculture is not to maintain merely, but to *increase* the productiveness of our fields. How can this be done? LIEBIG says truly that the 17 bushels of wheat annually grown on Mr. LAWES' experimental field, by the aid of good tillage alone, is "almost an average crop." But the object of Agricultural Chemistry, according to LIEBIG, is to *increase* the productiveness of our fields. This Mr. LAWES has done. Instead of 15 or 20 bushels of wheat per acre, he has grown 30 and 40 bushels, and in 1854 as high as 55 bushels; and, in a private letter recently received, Mr. LAWES informs us that some of the plots this year (1855) *more than double* the unmanured plot, the yield on which is still 17 bushels per acre.

On this soil, by good tillage alone, 17 bushels of wheat are annually grown. The object is to get a heavier crop. It was supposed that "as the crops on a field diminish or increase in exact proportion to the diminution or increase of the mineral substances conveyed to it in manure," that superphosphate of lime, potash, soda, lime, magnesia, sulphuric acid, chlorine, and soluble silica, or the *ashes* of the wheat plant, would increase the crop; *but they did not.* LIEBIG'S patent wheat manure was also tried in vain. But ammonia, in whatever form used, increased the crop. Six pounds of ammonia gave an extra bushel of wheat. But this extra increase only contains nitrogen equal to one pound of ammonia, and it is supposed that the remaining five pounds are evaporated through the plant, and that this loss of ammonia is necessary to the growth of the plant, or, at all events, there are at present no other known means of enabling the farmer to *increase* his wheat crop over 17 bushels per acre.

LIEBIG denies that any loss of ammonia takes place; but he has no evidence, aside from Mr. LAWES' experiments, on which he bases his denial. His argument is this:—If the plot without manure produces 17 bushels of wheat per acre, and one with 102 lbs. of ammonia 34 bushels, and if the increase is due to ammonia, it follows that the 17 bushels grown on the unmanured acre must also have required and removed from the soil 102 lbs. of ammonia. This we most fully admit. But LIEBIG says: "Such a conclusion it is impossible to support by any fact." This is his whole argument. It is "impossible" that the soil should contain, or that the rain and air should supply such a quantity of ammonia. A strange argument this, to be made by the very man who taught that if plants were supplied with a sufficient quantity of mineral elements in an available condition, they would obtain all the ammonia they required, from the atmosphere; and that, in the language of Prof. HORSFORD, "the ammonia spread on fields in the ordinary distribution of barn-yard products, is of no moment. The quantity with usual falls of rain *greatly exceeds, in the course of a season, any conceivable supply by human instrumentality.*" Now that it suits LIEBIG'S purpose, we are told that it is impossible that the soil, the atmosphere, and the rain combined, could supply 102 lbs. of ammonia—an amount contained in 600 lbs. of Peruvian guano, or in 5 tons of *good*, or 10 tons of poor, barn-yard manure! Furthermore, LIEBIG, in his *Chemistry in its Application to Agriculture and Physiology*, when speaking of the quantity of ammonia brought to the soil in rain water, says: "If a pound of rain-water contains *only* one quarter of a grain of ammonia, then a field of 26,910 square feet must receive annually upward of 88 lbs. of ammonia." An English acre contains 43,560 square feet; and according to this estimate, which we are given to understand is a low one, 142 lbs. of ammonia are brought to an English acre of soil by the rain which falls in twelve months. This estimate was made to show that farmers need not be at any pains to provide ammonia for their crops, as the atmosphere would supply a rich abundance—and, indeed, 142 lbs. of ammonia would provide more nitrogen than the grain and straw of the heaviest wheat crop contains! Now, when Mr. LAWES contends that the atmosphere and rain-water can not supply the wheat plant with sufficient ammonia for a large crop, because *it destroys ammonia during its growth*, LIEBIG turns round and oracularly declares this destruction "impossible," because "the soil" [of the unmanured wheat plot] "must have contained or received from the air or rain, *in seven years*, 618¾ lbs. of pure ammonia." In other words, it is impossible this destruction should take place, because the soil, the air, and the rain combined, can not furnish in a year 88½ lbs. of ammonia per acre, while, according to LIEBIG'S own estimate, the rain-water *alone* furnishes 142 lbs. of ammonia. It is difficult to argue with a writer who resorts to such pitiable subterfuges.

(To be concluded next month.)

NEW YORK PREMIUM FARMS FOR 1854.

THE last volume of the *Transactions of the New York State Agricultural Society* contains an account of the farm management of W. P. OTTLEY, Phelps, Ontario county, and of G. W. COFFIN, Amenia, Dutchess county, N. Y., to whom the society awarded the first and second premiums on farms.

Mr. OTTLEY'S farm contains 100 acres;—soil, a gravelly loam and muck with a tincture of clay; subsoil about the same, with a lighter color, and porous. Mr. O. says:

"I consider the best mode of improving my soil is a three year lay of clover, turning it under about the month of June for wheat, or the first of May for corn, with the application of barn-yard manure."

Is not clover apt to die out the third year? and would it not, therefore, be better to plow it up the *second* instead of the third year, as there would be more clover to turn under? If this is cropping the land too heavily with grain crops, the barley, instead of being followed by wheat, could be seeded down for a year or two with clover. Will our readers give us their experience on this point?

Mr. O. usually plows from seven to ten inches deep. He has used the "subsoil plow," as it is termed in the report, but which, as we learned by corresponding with Mr. OTTLEY, is in reality the Michigan *double* plow—a very different implement from the true subsoil plow, which only breaks up the subsoil without bringing it to the surface. *The first crop after the subsoiling was unusually light*, but the succeeding crops were productive, and the results on the whole satisfactory. Mr. O. has not tried true subsoiling, but intends to do so, and thinks that he will obtain in this way the benefits arising from a deep soil without diminution of crop the first year.

Mr. OTTLEY'S method of cultivating corn is as follows:

"Take a three year lay of clover, cover it with manure if possible, break it up immediately before planting with a double plow, eight inches deep, harrow with light harrow to avoid tearing up turf, then drill three and a half feet in width of row, dropping one kernel at eight inches in row, together with ashes and plaster; then roll and as soon as up pass through with one-horse cultivator. Continue to cultivate till the middle of June; hoe once; cut up about the first of September, five rows into one, shocks large, as the stalks will be of a better quality; husk during fall; product usually 50 bushels per acre."

Is it better to plant corn in drills, as above, or in hills, three and a half feet each way, four kernels in the hill, horse-hoeing each way?

"Barley is sown on corn stubble, plowed as early as possible; seed drilled in, two and a half bushels per acre, from the first of April to the first of May. Product from 25 to 50 bushels per acre."

The method of cultivating land for wheat is not given, except when it is sown after barley, when it is as follows:—plow as soon as the barley is off, with double plow, from eight to ten inches deep, in lands two rods wide; harrow fine just before time to sow; drill in the seed, two bushels per acre; clean out furrows and water furrows. Product usually from 25 to 35 bushels per acre. Clover and timothy seed are sown with the wheat.

Oats are drilled after corn as soon as the land can be got in good order, three bushels of seed per acre; cut when fully ripe with reaping machine, bind, and stock the same as wheat. Product about 75 bushels per acre.

Potatoes and carrots are cultivated as follows:

"One potato in each hill, split; plant as early as possible, harvest when fully ripe. Usually plant but one acre in corn-field; use no manure; hoe once; product light, owing to the prevalent disease.

"Carrots—sow thick in drills eighteen inches apart; plow ground, manure high with rotted manure, sow the first of June, hoe as soon as up; continue to hoe and thin out till the weeds cease to trouble. Product from 600 to 800 bushels per acre."

Mr. OTTLEY also obtained the second premium for experiments in draining, there being none offered which were considered worthy of the first premium. Surely this is not a true indication of the estimation in which underdraining is held in the great State of New York! Mr. O. laid 200 rods of stone drains in nine acres, and the result was quite satisfactory. He says:

"The increased value of the land, taking the field (twelve acres) together, I estimate at $5 per acre annually, better than before its being drained. It is safe reckoning that draining will pay for itself with interest of cost in two years."

Mr. O. also laid down 100 rods of tile underdrains, from two to two and a half feet deep, and four inches wide at bottom. The cost was, for digging, 12½ cents per rod; tile on ground, 16 cents per rod; laying and filling, 3 cents; total, 31½ cents per rod. The drain laid with stone cost, for digging, 20 cents, and for laying the stone and filling, 20 cents; total, 40 cents per rod, or 8½ cents more than the tile drains. Unnecessarily high as is the price of tiles, it pays better to use them than stones in most cases.

THE FARM OF G. W. COFFIN.—The farm of Mr. COFFIN, which obtained the second premium, contains 108 acres, two-thirds of which is a limestone loam, and the other third black slate. Like Mr. OTTLEY, Mr. C. looks to clover or "grass" for increasing the fertility of the soil. He says:

"The best mode of improving the soil is to keep it stocked down to grass, taking care in pasturing not to allow too close feeding off, and such portions as have furnished the winter stock of hay, should receive a dressing of manure, as soon after the hay has been removed as convenient. August is the best time. A thick mat of grass left on the land in autumn, answers the double purpose of protecting it from the searching wind and biting frost, affording a rich bed of manure as well adapted to its growth as any that can be applied. Barn-yard manure is an invaluable source of improvement. A complete and thorough breaking down of the soil when preparing it for crops, especially for seeding to grass, seeding with a bountiful supply of timothy and clover."

Mr. C. made some experiments with artificial manures on grass, which are worth recording. Soil, tenacious limestone loam, old sod of red top, June grass, and white clover. The results were as follows:

	lbs. hay per acre.
Without manure of any kind	2,000
400 lbs. of Peruvian guano, costing $10	4,000
800 lbs. plaster, costing $2 60	2,480
400 lbs. superphosphate of lime, costing $10	3,040
Unleached ashes, 26½ bushels, costing $3.31	3,540

The ashes are much the most profitable manure for grass in this instance. There can be no doubt that the continued exportation of hay from a farm tends greatly to exhaust it of potash, more so, perhaps, than any other crop except potatoes; and it is therefore reasonable to suppose that unleached ashes, containing so much potash, would have a good effect. But if the ashes were beneficial because they supplied potash, to what shall we attribute the increase obtained from the guano, which contains scarcely any potash? If we could place full confidence in the experiment, we should conclude that the ashes acted by accelerating the decomposition of organic matter in the soil, and rendering ammonia available.

An experiment was made on potatoes with the following result:

Ten hills without any manure gave	13 lbs.
" with handful of fresh ashes	6½ "
" with handful of compost hen manure	19½ "
" with handful of plaster	19½ "

The manures were applied in the hill at the time of planting; the ashes proving too strong, but each of the others increased the yield at the rate of about 50 bushels per acre.

Superphosphate of lime was used on corn "*without any apparent effect*," while "plaster *increased the growth greatly.*" And yet superphosphate contains a considerable quantity of "plaster." It should at any rate have increased the growth to the extent of the "plaster" it contains. We fear such experiments are not very reliable. 200 lbs. of guano applied to oats "advanced their ripening about six days." The same amount of superphosphate "*had no apparent effect.*"

An experiment in suckering corn showed that it did neither good nor harm.

After six years' careful experimenting, Mr. C. is "compelled against all former notions" to believe that corn for seed should always be taken *from the small end of the ear;* that from the large end, however, he finds better than that from the middle.

Mr. C. usually grows about two acres of corn for feeding green in August and September, when the pastures become short.

He turns over green sward from first of June to tenth of July, and sows at intervals of two weeks. Makes broad furrows, three feet apart, and scatters from fifty to sixty grains to the foot covering by passing the harrow once across the furrows.

"Four times as much cured fodder," he says, "can be produced in this way as is generally taken from the same amount of ground in hay."

Mr. C. thinks "Indian corn is the most reliable crop, and though requiring a greater amount of labor, is still one which pays the producer a higher per centage than any other." His method of cultivation is as follows:

Usually plow sod land that has laid from eight to ten or even fifteen years. If the land is naturally dry, turn the furrows flat; if heavy and inclined to be moist, lap the furrows. Plow from four to six inches deep, harrow lengthwise of the furrows, and mark with a drag, three feet apart each way for medium sized varieties of corn, and further apart one way for larger. Distribute from four to six grains *about* in the hill, and cover one inch deep. Plant about the 10th of May, eight quarts to the acre. After trying various methods of preparing seed corn by soaking and rolling in different substances, I have abandoned the whole, and plant as it comes from the cob. Prefer applying stimulants on the young plants as soon as they make their appearance; use plaster and ashes—one part of the former to two of the latter, mixed—a small handful applied to two hills. I have thrown the plow aside in cultivating, and use a steel tooth cultivator twice in a row each way; have a man follow with a hoe to set up the injured corn and attend to such weeds and grass as are in and near the hill. As soon as it attains to the height of about six inches, have all hills containing more than four spears thinned to that number. Apply plaster and ashes in about the same quantity as at first, and by the time the corn is twelve to fifteen inches high it has received its last cultivation by horse power. In case of a wet July weeds start up some, but are taken out either with the hoe or by hand. The sod lies as it was turned in the spring, its inverted surface having been moved for a few inches deep only.

"I have tried experiments in harvesting, and find that the most grain is obtained by cutting at the ground and stouting (or stooking) if it is done at the right time. A little observation will decide when that is, as the corn becomes glazed, husks turn white, and the leaves die along the edges—usually from the 10th to 20th of September. Put twenty-five hills in a stout, and on husking make two bundles of each. Secure the stalks as soon as possible after husking."

Mr. C. has used the subsoil plow on a portion of several fields of different soils and for different kinds of grain; but except in one instance, although several years have since elapsed, there was "no perceptible difference in the yield or growth at any time." The exceptional case was:

"In a field on another part of the farm, less loam and more clay in the soil; used the subsoil plow to about the same depth (18 inches) on one land only; sowed the whole lot to oats, and could see soon after they came up that on the land subsoiled they looked yellow and sickly for the first two weeks, but then began to improve, keeping on until they presented the same appearance as the rest of the lot, no one being able to perceive any difference up to the time of harvesting. On gathering, the difference was so apparent that one could have almost told with his eyes shut as soon as he came to this land. Although there was about the same growth of straw as on other portions, yet the bundles were much heavier and heads better filled. The amount produced by subsoiling must have been as much as eight bushels to the acre more than where the common plow was used only. No perceptible difference in the grass this last summer."

We have no means of knowing from the report, but we opine that Mr. C. used the true subsoil plow, and not the double plow used by Mr. Ottley.

There are many other interesting points in Mr. Coffin's practice to which we might allude did our space permit. We will conclude with the following extract in regard to the neglected subject of irrigation:

"There is a never-failing stream of hard water running through the middle of my farm, a distance of one hundred and thirty rods, and in that distance falls sixty feet. It is taken from its entrance on the farm, and conveyed in an open ditch along the sloping grounds that descend towards the natural stream, and turned out so as to spread over about five acres of meadow. These meadows are near the barn, and are fed down in the fall and spring until they exhibit a prospect of no great yield of hay. The water is turned on generally the first week in April, and changed from week to week to different places, until the fore part of June, when it is allowed to spread out upon a pasture lot.

"So enormous has the growth of grass become by the last of June, that we often cut the heaviest portions and secure them before the month is out. Three tons per acre have been cut from the watered portions, while that adjoining, without water or irrigation, would scarcely yield a ton, though the soil and grasses were of the same nature."

There are hundreds of farms where the same system of irrigation might be practised with equally gratifying results.

Soot as a Manure.—Soot is used in England to considerable extent as a manure for wheat. It contains much ammonia, and Bousingault attributes its high fertilizing effect to this ingredient. The experiments of the late Professor Anderson showed soot to be a valuable manure for wheat, for timothy, and for other grasses, *while it had no good effect on clover.*

Thick and Thin Sowing of Wheat.—A seed firm in England, Hardy & Son, of Waldon, Essex, who are advocates of thin seeding, give the following tabular statement, showing the distances required for planting or sowing various quantities of wheat grain:

There are from 16,000 to 20,000 grains of wheat contained in one quart, or 608,000 to 640,000 in one bushel, and 6,272,640 square inches are one statute acre of land. Taking the latter number as a rule, it necessarily follows that about 10 square inches are thus allowed for each grain, admitting all the land to be sown uniformly without furrows, or 14 grains on each square foot, or 132 on each square yard, or 4000 on each square rod, at one bushel of seed for an acre. The following simple tabular form will, we trust, serve to show the different distances from each plant, at this ratio, from more or less quantities of seed, which may or may not be thought most proper to be sown by any of our agricultural friends. For general sowing on a large scale we ourselves think proper to draw a line of distinction, say one bushel or somewhat less for an acre, avoiding either extremes; bearing in mind, however, the fact and possibility of growing a large amount of produce from a small quantity; and the impossibility of reaping an average crop from a full plant of a large quantity of seed.

Per Acre.	Grains for an acre.	Grains for a rod.	Grains for a yard.	Grains for a foot.	Inches for each grain.†
8 bush.* gives about	1,920,000	12,000	396	44	4
2 " "	1,280,000	8,000	264	29	6
1 " "	640,000	4,000	132	14	10
2 pecks	320,000	2,000	66	7	20
1 "	160,000	1,000	33	3½	43
½ "	80,000	500	16½	1¾	81
¼ "	40,000	250	8¼	1	163
1 quart	20,000	125	4	0	324
1 pint	10,000	63	2	0	649
½ "	5,000	31	1	0	1299

* At 20,000 grains to a quart, and 6,272,640 inches in an acre.
† Omitting fractions.

MANURE SHOULD BE WELL MIXED WITH THE SOIL

The *Country Gentleman*, in alluding to several large ruta bagas reported in that paper, says:

In the year 1836, when the ruta baga crop was much more extensively cultivated in Western New York than at present, a root was selected from a crop raised by Wm. R. Smith, of Macedon, Wayne county, which weighed *fifteen* pounds—and from a crop raised by Edward S. Townsend, of Palmyra, in the same county, three were found of equal size to this, and one which weighed *eighteen pounds*. It would apparently not go into a peck measure. The soil was very deep and fertile, being the site of an old removed stable, the season was very favorable, and *plenty of room* was given for growth—a thing too often neglected, and which the ruta baga especially needs. Several square rods yielded at the rate of 1200 bushels per acre—the piles of these monsters were indeed striking. The weighing was done in the presence of one of the editors of this paper. * * * These show the great importance of a very highly enriched, and still more of a *well intermixed* soil, for the *same amount* of manure as existed on the site of the old stable, applied in the common way in the season of sowing, would certainly not have produced one-third the size, as multitudes of experiments have proved. We should be glad if our scientific agriculturists, in the course of their reasonings and discussions on the relative value of yard manure and guano, would take into consideration *the manner of application to the soil*. For it will be reasoning to no purpose, to go into a calculation just how many miles and rods it will pay to draw manure, without knowing whether, when it reaches its destination, it is to be thrown on the top of the earth, and perhaps half of it plowed under in lumps as large as a fork-full, and there remain; or whether it is finely pulverized and thoroughly intermixed by repeated harrowings and occasional plowings. Where the latter mode of treatment is thoroughly applied, the effect of a ton of yard-manure is often at least QUADRUPLED, when compared with the ordinary careless manner of burying—such at least is the result of the experiments we have witnessed. And the superiority of old enriched soil with the fertilizing ingredients completely diffused, as in the ruta baga crop above mentioned, amply corroborates the opinion.

Prof. Way, in one of his lectures before the Royal Agricultural Society of England, alluded to this subject. His experiments, he said, showed that the soil was no idle spectator of what took place in it; that it was not a mere meeting place for the roots of plants and the food they were to grow upon, but that it was actually the stomach of the plant. Or he might go further, and say, that nature had actually given to the soil the function and office which in animals is performed by the gastric juice and the chyle—that of preparing and digesting the food of plants. This is perhaps somewhat fanciful, but that it is very advantageous to thoroughly incorporate manure with the soil, no observing farmer can doubt. This can not always be safely done by "repeated harrowings and occasional plowings," inasmuch as under ordinary cases they would drag to the surface decomposing manure, and expose it to much loss. Yet every farmer should be convinced that it is desirable to mix the manure as much as possible with the soil, whenever it can be accomplished without loss or inconvenience. At any rate, more care should be exercised in spreading, shaking out, and plowing under the manure.

For root crops, it has always been recommended to ferment the manure to a considerable extent before its application. The reason for this rule laid down by practical men, is probably to be found in the fact that thoroughly decomposed, or what the London gardeners term "spit" manure, (because it is cut with a spade,) can be more easily mixed with the soil. A practical English farmer is in the habit of applying manure to the land intended for turnips, soon after harvest, in the fall, plowing it in, and giving the land two or three plowings and harrowings before the turnips are sown in the spring. He has found from experience that this is the best method of using manure on his soil, which is rather heavy. The writer of the article above quoted is one whose statements are always within bounds, and whose observations are entitled to consideration, and he says, from the experiments he has witnessed, the effect of manure thoroughly incorporated with the soil "is often at least *quadrupled* when compared with the ordinary careless manner of burying."

In determining the relative value of yard manure and guano, recourse should be had to careful analysis. If manure acts beneficially in supplying food for plants, then the relative value of manures, other things being equal, is in proportion to the relative amount of the organic and inorganic plant-food which they contain. The "manner of application to the soil" may be left out of the question, for it does not affect the *actual* value of the manures. If a ton of yard manure contains as much fertilizing matter as 100 lbs. of Peruvian guano, we shall not be far wrong in considering it of equal value to the guano, even though from bad application it produces a less effect on the crops. Because, from the careless manner in which yard manure is applied on some farms, it is found unprofitable, are we to conclude that "no farmer can afford to draw manure a mile, even if it is given him," while the *actual* value of the manure is much more than sufficient to cover this expense? In determining the relative value of manures, the only safe rule is to conclude that each is applied in the best manner.

Red Camomile to Destroy Insects.—The *Journal d'Horticulture de Belgium* states that a powder made from the flowers of the red camomile *(Pyrethrum roseum)* emits "an odor so strong and penetrating that it kills all the insects and all the vermin of which until now no certain agent of destruction has been found." An Armenian merchant traveling in the south of Asia, observed that the inhabitants sprinkled themselves with a powder to prevent the sting of insects. He found that the powder was "nothing else than that made from the flowers of the red camomile." The plant is quite hardy, and is now cultivated to a great extent in Southern Russia. In Trans-Caucasia alone 88,000 lbs. of powder are annually made for consumption in the Russian Empire. Baron Folkersham has published a paper on the cultivation of the red camomile. He says:—"This powder preserves you from fleas and bugs; it kills flies, gnats, maggots, lice, and even the worms which are produced in the wounds of our domestic animals." He hopes it will be tried on insects injurious to horticulture, and adds that if experiments demonstrate the efficacy of the powder in this respect, each person could cultivate in the corner of his garden plants enough to kill the insects, &c., which ravage his field.

TRIAL OF SEEDS FROM THE PATENT OFFICE.

Mr. LEVI BARTLETT, whose able article on Rape, in the present number of the *Genesee Farmer*, will be read with interest, has given the *Country Gentleman* the results of his experiments with seeds distributed by the Patent Office. We have space this month for only a few extracts in regard to the

"CABBAGE AND TURNIP TRIBE.—Of the *cabbage* and *turnip* tribe of plants, I had several varieties. For the turnips, the first week in June carted upon a plat of green-sward, warm fresh manure at the rate of thirty cart-loads per acre; ground well plowed, rolled and harrowed—drills 27 inches asunder; a sprinkling of De Burg's superphosphate dropped in the drills; seed sown by the hand, and covered by the head of a rake. The plants came up well, and were not attacked by any kind of insects. They were gradually thinned, so as to stand in the drills from 18 to 24 inches.

"The two first drills, on the north side of the plot, were sown with 'Ashcroft's Swedish turnip,' labelled, 'A large variety, with a reddish top, and yellow flesh, hardy, and of quick growth.' With me they have proved fully equal to the above description. The top of the bulb is reddish, not the leaves. For the table, they are now the best variety that I have ever grown, and a large portion of them are almost as perfect in form, as if turned in a lathe. Should they prove as good in future trials, they will become a great favorite with turnip culturists.

"The two next drills, 'River's Stubble Swedish Turnip,' labeled, 'large and first-rate sort in every respect, especially for late sowing.' This variety came fully up to the chalk; the bulbs were rather larger, but not so handsomely formed as Ashcroft's, and we do not think them as good for the table. This turnip would probably succeed well on stubble ground, after a crop of wheat or barley had been harvested.

"The two next rows, 'Sutton's Purple Topped Hybrid Turnip from England, the hardiest, largest, and most nutritious of all hybrid turnips'—so said the printed label upon the package, and I shall not contradict the statement. They produced enormous leaves, and I gave them a wide birth, about two feet each way, which is near enough. This, with the two next varieties are of the English, or flat kind. They were sown too early. The seed, according to the ideas of some of our 'old fogies,' should have been kept out of the ground till the full moon in July. The three kinds produced heavy crops, but grew somewhat corky. They were fed to my oxen and young cattle.

"Two rows 'Yorkshire Paragon Turnip, a fine, new white globe variety, very large and solid'—so said the printed notice upon the package; and as far as I could determine, they proved 'true to their kind.'

"Two rows of 'Lincolnshire Red Globe Turnip; a superior variety, more solid and larger than any other variety.' If they can grow better turnips of this variety in Lincolnshire, England, than I have raised this season, I should like much to see samples of them.

"One row 'German Greens,' a fine plant for boiled greens. The leaves are thick, succulent, and like the Scotch Kale, very much crimped. A plant well worthy more general cultivation. A few roots taken up in the fall, stored in the cellar, and sat out in the spring, and a dozen or two of seedlings, properly cared for, would keep up a succession of greens from early spring till autumn, and would save the 'women folks' the labor of scouring the fields in search of a mess of dandelion."

We saw, last fall, a very fine crop of "Greens" in the garden of Mr. DINGWALL, of Albany, equal to any we ever saw in Great Britain, where they are found in every garden. The leaves when young and properly cooked, are very tender and delicious. In England they withstand the winter, but in this latitude they must be covered with soil, or taken up and stored away in the cellar during winter.

"Two rows 'Kohl Rabi.' This plant seems to be a 'fusion' between the cabbage and turnip. The *Kohl* rises in a thick stem about eight inches out of the ground, terminating at the top into a globular form, somewhat like a large Swedish turnip, the bulb of a milk green color. This vegetable is sweeter, more nutritious, and more solid than either the cabbage or white turnip; produces a greater weight per acre than the latter; it is also hardier and keeps better than any other bulb, and imparts, when fed to cows, but little of that flavor known as 'turnipy,' either to butter or milk. The seed sown at the time of sowing the Swedish turnip, and cultivated in the same way. The bulbs may be kept sound and nutritious until very late in the spring, even later than those of the Swedes or ruta baga turnips. The above is principally copied from the last Patent Office Report. I cultivated about 200 plants of the Kohl. I cut up half a dozen of them, 3d day of October. They averaged six pounds per bulb. These, however, were of the largest size.

"The next row was sown with Early York and Milan Cabbage seed. I will here remark, that the plants removed and set on similar land, did altogether better than those left and cultivated in the drill. From this I infer that transplanted cabbage do best."

There can be no doubt on this point.

"On the 12th of June, carted at the rate of 30 loads of partially fermented manure upon sward land adjoining the turnip ground already described; plowed, rolled, and harrowed, the same as for turnips. On the 14th commenced setting cabbage plants. The two north rows were 'pure Early York,' seed from the Patent Office; holes for the plants were dug with a hoe; plants set by hand, not dibbled.

"First row, 12 plants, east end, Peruvian guano, (about a teaspoonful mixed with the soil excavated by the hoe,) next 12, superphosphate; next 12, Mexican guano; next 12, same amount of gelatine, (an artificially prepared manure, manufactured from old boots, shoes, scraps of leather, &c.; a sample of about 20 pounds was sent to me to experiment with from the manufacturer, Boston.) Second row had the different kinds of manure reversed, that is, the gelatine was used in the hills of the 12 plants opposite the guano—the guano to the 12 plants, west end of second row—superphosphate and Mexican guano, reversed in the second rows. Very much to my surprise, I was never able to discover the least difference in the plants, from the different manures, from the time of planting till harvesting."

The 30 loads of manure probably made the land so rich that it did not need artificial fertilizers.

"The two next rows, planted with 'Milan, healthful or salutary cabbage, selected by the agent of the office in France.' This cabbage very closely resembles the choicest variety of Savoy, growing much larger, with more compact heads than any Savoy I have ever raised. For the table I put them down No. 1. A heavy, warm rain the 2d day of October, caused many of the York, and some of the Milan, to *'burst* their boilers.' Next day I cut a large wheelbarrow load of the Yorks; they averaged six pounds each—rows 2 feet apart, plants 18 inches in the rows. Great numbers of the Milans weighed from 12 to 14 pounds each. The manure used on the balance of the ground was about an equal mixture of the four kinds above named.

"The two next rows, 'Mammoth Broccoli.' They produced a large amount of foliage, but none flowered."

Mr. BARTLETT well remarks:

"The turnip crop has been said to be the sheet anchor of British Agriculture; but the climate and temperature of old England and New England are quite dissimilar. With such seasons as the past summer and autumn, the turnip can be most profitably grown here; but with such seasons as 1853 and 1854, it is a precarious crop. Those two seasons, the fly took the plant in the seed leaf; then the drouth, lice on the leaves, fingers and toes and rot, nearly used up the crop of cabbages and turnips on half an acre. The past season, neither fly, louse, drouth, rot, or scarcely fingers and toes, have injured any of the several varieties of cabbage and turnips I have cultivated.

"But notwithstanding the risk of an occasional failure of the turnip crop, I think it would be for the interest of most farmers to grow them in connection with other green forage, both for autumnal and winter feeding. Some sort of succulent food, in connection with the dry winter foliage, usually fed to our cattle, is indispensable to their perfect health and thrift."

THE TURNIP CROP OF ENGLAND.

THE *Mark Lane Express* has an article on "The Failure of the Turnip Crop and its Consequences," from which it appears that owing to the fly, drouth, mildew, finger and toes, grubs in the crown and at the roots, "the injury is general, and the crop on the whole worse than we have witnessed for many years past." The *Express* thinks the failure is owing in some degree to the too frequent cultivation of turnips on the same land,—one-fourth of the arable land being in turnips every year. It says:

"The continuous propagation of any description of plant upon the same land for a series of years tends to a depreciation of its productive qualities, and such depreciation is pretty certain to be carried out to the plants also, as we yearly proceed."

This is a conclusion which the facts presented do not warrant. It does not follow that *because* a soil cultivated for a series of years without proper manuring decreases in fertility, that *therefore* the plants grown on this soil will deteriorate and become more liable to disease. It may be so, but we are opposed to laying down as a "fixed fact" that which is merely probable or potential. The following sentence, however, embodies an important truth:

"Upon a proper rotation of crops the main success of all cultivation depends; the cereals alternating with the legumes, root crops, and grasses, constitute the true application of the science of agriculture."

TO MAKE HARD WATER SOFT.—Water is frequently hard from holding in solution a quantity of carbonate of lime. It may be rendered soft by the addition of a little quick lime. The *rationale* of the process is this:—Carbonate of lime is insoluble in pure water, but soluble in water containing carbonic acid. Any water, therefore, that contains carbonate of lime in solution contains free carbonic acid. When quick lime is added, this free carbonic acid unites with it, forming the insoluble carbonate of lime; which, together with the carbonate of lime originally in the water, falls to the bottom of the vessel, and the supernatant water is soft.

PERUVIAN AND MEXICAN GUANO FOR WHEAT.—There are persons claiming to be "scientific" who assert that the guano obtained from the rainy coasts of Mexico is superior to that from the rainless island of the Pacific, because the former frequently contains the greatest proportion of phosphates. We have frequently expressed the belief that this Mexican guano—having lost by leaching and fermentation all or nearly all its ammonia—would be of far less value for wheat, corn, etc., than the highly ammoniated Peruvian guano. The Rev. WM. CLIFT, of Stonington, Conn., writes the *American Agriculturist* that he has used on wheat Mexican guano, which was analysed by Dr. CHILTON, and advertised as "fully equal to the best Peruvian guano," side by side with Peruvian guano, the same quantity (464 lbs.) per acre being used in each case. The soil was "a gravelly loam, not in very good heart." We give the result in Mr. CLIFT's own words:

"The seed came up well and the whole piece looked promising. As it was the first piece of wheat grown in the neighborhood for twenty years, it had the full benefit of close observation, and the whole category of wheat evils was prophesied upon it, from the blast to the weevil.

"The portion of the field dressed with Peruvian guano soon showed its superiority. The line where the dressing began was distinctly marked by a deeper green and a larger growth; and this difference was maintained up to the ripening of the grain. This part of the field was so heavy that some of it lodged. There was a larger growth of straw, longer heads, plumper kernels, and more of them. We had to reap the whole of this part of the field, while the most of the other was easily cradled. The Mexican guano was so manifestly "no where," that we did not think it worth while to accurately measure the yield of straw and grain upon each part."

SUBSOILING VERSUS DROUTH.—The Secretary of the Queens County (N. Y.) Agricultural Society, Mr. JOHN HAROLD, in his report in the Transactions of our State society, mentions the following fact in regard to subsoiling:

"During the month of August we were invited by one of our members to go over his growing corn and take note of *his* method. The land had been *subsoiled*, and although the drouth was severe, the leaves were a fine dark green and the silk luxuriant, seeming scarcely to suffer from the great heat. In the adjoining lot, only separated by a post and rail fence, the stalk was drying up and the ears small and poorly filled. A spade was procured, a hole dug; about eight inches deep we came to a hard-pan, and with considerable labor broke through it. Below, the earth was as dry as ashes. The subsoiled lot of our friend was then tried; the spade went down into a mellow soil, and at two spades' depth it was moist and mellow. No wonder his corn looked flourishing."

Will Mr. HAROLD inform us whether the true subsoil plow was used, or the Michigan double plow?

WINTER.—There is no less truth than poetry in the following lines from *Tomson's Seasons:*

"All nature feels the renovating force
Of Winter, only to the thoughtless eye
In ruin seen. The frost-concocted glebe
Draws in abundant vegetable soul,
And gathers vigor for the coming year."

EDITORIAL CORRESPONDENCE FROM CANADA WEST.

HAMILTON, DEC., 1855.

AMERICAN buyers are rapidly exchanging Yankee currency for Canadian wheat; and it would seem that Canada must soon become drained of *wheat*, or the States of *money*, so rapidly is the trade going on at every little village or railroad station where wheat can be shipped. The Canadian farmer pockets his well filled purse, and will tell you, with a self satisfied smile, of the years gone by, when he was compelled to sell his crop of wheat at from three to four "York shillings" a bushel, after hauling it ten or fifteen miles. Now he can get sixteen shillings, and find a market within a mile or two of his home. It is not surprising that Canadian farmers are endeavoring to increase their wheat crop. Land is cleared in a hurry, or partially cleared; and wherever there is soil enough to cover a grain of wheat, there it is sown. Other crops for the time are neglected, and the Canadian farmer is determined to make hay while the sun shines.

The soil here is finely adapted to wheat-culture, and the average is large. Every farmer with whom I have conversed, has given his average at more than thirty bushels. WM. HERBER, of Blenheim township, raised 800 bushels on 22 acres; WM. TENNANT, of the same town, raised 861 bushels on 21 acres, being 41 bushels to the acre; ALEX. MANN, 333 bushels on 11 acres, new land, just broken up; JOHN G. BARRDO, 95 bushels on 2½ acres. WM & L. H. DANIEL, and others, in the 4th concession, Blenheim, showed me some of the finest specimens of wheat I have ever seen. Our Canadian friends must be careful not to kill the goose that lays such golden eggs. The favorite "*rotation*" here (Canada West) seems to be *wheat*, then *summer fallow*, and *wheat again*. I occasionally see a field of clover, though but very seldom. It is a question of some importance whether this almost entire devotion of tillable land to wheat-culture will not tend to invite the attacks of destructive insects, and facilitate their increase and consequent destructiveness. I hear some complaints of the Hessian fly, and also of the wheat midge, which has proved so destructive to the wheat crop of the Genesee Valley the past two years.

The people of Canada West are well pleased with the "reciprocity treaty," as well they might be. It not only raises the price of wheat, but of all other produce, to within a fraction of the price given in the States. Stop at any hotel in this part of the country, and even in distant country villages, and you will find Yankee purchasers of wheat, pigs, poultry, and of almost every article that the farm produces. It is amusing, if not edifying, to take a seat in the bar-room of an evening, and hear the discussions carried on between these American buyers and the neighboring farmers and loungers that "happen in." The Americans seem to think themselves republican missionaries, whose duty it is to advocate and defend republican principles; while the Canadians are equally intent on sustaining the policy of the "allies," the justice of the war with Russia, the beauty and fertility of the country, and especially the superiority of Canadian *wheat* and *women*.

There is a great scarcity of fruit in all the country where I have traveled. Indeed, a good apple is not to be found in one farm-house in a score, and at the public houses you are fed on apple-sauce and pies made of dried apples. This is bad enough at any time, but at this season it is *barbarous*. Apples are selling at Hamilton, and most other towns of Canada West, at $1 per bushel. It would pay to send apples here from Rochester.

I was pleased to see so many *stump machines* in active operation. On the pine lands, this seems to be the only way to get rid of the stumps. An old gentleman whom I found pulling stumps, informed me that he had waited twenty-five years for his stumps to rot, and now he had become tired of waiting, and was determined to have them out. My curiosity was excited by a person I saw boring the pine stumps with an auger. On inquiring the object, I found he was boring a hole in each stump, an inch in diameter and three or four deep, and then putting in the hole about a table-spoonful of saltpetre. This, he had been informed, after remaining about six months, would cause the stump to burn freely, so that when once set on fire it would be entirely consumed, root and branch.

Nothing has pleased me so much, in my travels, as the Canadian *barns*. The farmer may live in a poor log house, apparently destitute of comfort and convenience, but behind it you will see an excellent frame barn, well made, and large enough to hold a couple of the barns common on our side of the Niagara river. The lady of the house will tell you that they are to build a new house next summer. Indeed, it would seem that about two-thirds of the Canadian farmers are about to build new houses next year, and the other third have just finished building. Mechanics are scarce and wages high, and I have seen scores of farmers who would have built houses the present season if they could have procured workmen. Canada has never known such a season of prosperity, and I have seen but one man in the Province who dared to speak of *hard times* or the *scarcity of money*—those standing topics of grumblers.

I was surprised to find so many American settlers here. I should judge that nearly one-fifth the residents here are Americans, and full another fifth Scotch. The Scotch seem to be the best of farmers; and the native Canadians are a kind-hearted, free-souled set of men.

Less pork is used here than in the farming districts of the States, and few of the hogs I have seen killed here weigh over two hundred pounds. All seem to show a preferance for small pork. On almost every farm is seen a fine flock of long-wooled sheep—regular *mutton* sheep. Canada farmers will not touch Merinos.

I may resume this rambling letter next month.

J. V.

CARE OF HENS IN WINTER.—Farmers as a general rule neglect their hens in winter. They are left to pick up what they can find about the barn-yard; if they get sufficient food, well; if not, no matter. This is cruel, and decidedly unprofitable. If it will not pay to keep them in good condition, it will not pay to keep them at all. They should have a warm and clean place to roost in, and the farmer should see that they never suffer from lack of food. A little light grain or buckwheat, with a few boiled potatoes, turnips, mangel wurzel, or other succulent food will generally be paid for by the eggs laid during winter and in the spring fourfold. Hens starved during winter will not furnish many eggs the coming spring.

NOTES BY S. W.

I am indebted to my friend Samuel Clark, ex-Member of Congress from Kalamazoo, Michigan, for the *Patent Office Report* for 1854. In my opinion the best contribution in the report is from Professor Charles T. Jackson, of Boston, Mass.; not because his views of vegetable chemistry are all entirely new and original, but only that they are graphically explained and their verity is endorsed by the practical experience of every educated observing farmer; which is higher praise than can be awarded to that portion of the learned who advocate original but impossible theories long after they are exploded by the lessons of practical experiment.

After noticing the fact that soils generally are abundantly supplied with the mineral ingredients for crops, except the alkalies and phosphoric acid, he says these are generally found in ashes, guano, and superphosphate of lime, all of which are now known to farmers as the most valuable of saline manures. But with still better reason he says:—"A certain amount of vegetable matter or humus is necessary to the formation of a good and enduring soil; and though saline manures will often by themselves produce a good crop on a poor and apparently exhausted soil, they do, nevertheless, sometimes fail, owing to the want of a sufficiency of humus to retain the moisture requisite to healthy vegetation, as also for the production by slow oxidation of carbonic acid gas required for the foliage." To which may be superadded the fact that the same vegetable humus also contributes to the above recited indispensable saline ingredients of plants after its mechanical office has ended with its decay. Methinks hereby hangs the secret of the persistent fertility of the great alluvial West, where vegetable matter in every form of decomposition is always present in the soil. Even on those old fields which have been planted to maize for thirty years without manuring, the large amount of vegetable matter fed in the field annually, or left on it to be plowed in for another crop, more than compensated for the cereal ears removed from the soil.

Let any man try the following experiment:—Take two plots of moderately fertile, well-drained soil, two rods each; treat one with guano, or its equivalent in hen dung; the other with long stable manure, containing even less nitrogen; spade in the manure evenly and deeply to both plots, and plant them early with Indian corn. The guanoed plot may do best the first few weeks, but even if the season is none too dry, the other plot will in the end give a much larger increase of both ears and stalk; and if the same plots are planted with corn without manure the next season, the plot treated with long manure will distance the other still more, both from the beginning to the end of the race.

As Dr. Jackson well says, "vegetable manures always form acids, or electro-negative substances. Animal matters, by their decay, produce alkaline, or electro-positive matters, chiefly ammonia and basic salts; hence it is obvious that when vegetable and animal matters are mixed together, we shall have a combination between the acids and alkalies resulting in the formation of neutral salts; and since the vegetable acids have an active affinity for ammonia, with which they readily combine, they prevent the escape of this valuable gaseous manure, and preserve it in its most available condition for the nutrition of plants." Hence the importance, in order to make the most economical as well as effective use of ammoniacal manures, like Peruvian guano, tafeu, etc., that they should be composted with dry swamp muck, rotten wood, etc., before they are applied to the soil. Dr. Jackson says that plaster when mixed with swamp muck or decayed peat will aid in fixing ammonia, while plaster alone is insufficient; as a substitute when muck cannot be had, he advocates the growing of green crops, clover, spurry, field peas, or buckwheat to supply the soil when plowed in with that vegetable mold so necessary to enable the soil to retain moisture and prevent the escape of the ammonia applied to it. But methinks such a green crop, rich as it is in nitrogen, as well as in all the other elements of plants, would almost suffice of itself as an amendment to the soil, without the aid of Peruvian guano.

But there is another office which vegetable manures perform in the soil not less important than those already enumerated, to wit: the power of their acids to decompose the minerals of the soil into available plant food. Dr. Jackson says:—"Acid matters of all kinds tend to decompose the minerals of the soil, and that decomposition results in bringing out in an available form for vegetable nutrition the alkaline matters of calcareous rocks and their debris, which constitute the mineral bases of all soils. Rocks, before ferruginous and brown, come out of the peat bog perfectly white; and granite has its felspar and mica decomposed and their alkalies extracted, while only pulverulent mica remains. A rock containing limestone is found deprived of it, and cavities are left where the calcareous matter formerly existed. In a similar manner all recent vegetable mold acts on the comminuted minerals of the soil, disengaging from them their alkaline ingredients." Hence the alkaline wealth of calcareous clay loam and limestone soils in Western New York. S. W.—*Waterloo, N. Y.*

Farmers' Winter Meetings.—The *Boston Cultivator* well says:

"Associations for the discussion of agricultural subjects are among the most useful means of improvement. It matters little what these associations are called, if they only bring farmers together and induce them to interchange ideas. The farmers of a neighborhood, a school district, or a town, may have their stated meetings for this purpose. A simple organization only is necessary, for conducting business in an orderly manner, and preserving such a record that the light elicited may not be lost. A president, secretary, and board of managers, would comprise the officers. The topics brought before the association, might be introduced by lectures, or by special dissertations, from such persons as are deemed capable of doing justice to them. Each member can then express his own views; and when the discussion is concluded, it will be proper to take the sense of the association by the passage of a resolution embodying the facts which have been reached.

"Meetings of this kind stimulate to reading and thought, and their records, through the medium of the press, awaken attention and diffuse intelligence through the community. The ideas thus brought out will be regarded with interest by coming generations, as showing the state of agricultural knowledge at the present time."

THE RAPE PLANT.

AGREEABLY to your request, I herewith furnish you with the results of my experience in the culture of the rape plant for the two past seasons. In the spring of 1854 I received from the Patent Office a package of rape seed. It was sown about the 15th of June, at the time of sowing Swedish turnips. The land the previous year (1853) had been well manured and planted with field carrots and parsnips. The manure used for the rape and turnips was guano, at the rate of 300 lbs. per acre. Both kinds of plants came up well and grew finely, but the rape took the lead altogether. As I hoed them I thinned the plants to the distance of eight or ten inches. Sometime in August I found the plants stood too thick in the drills, and commenced cutting every other plant and feeding them to my cows; but in the course of two weeks they had become so infested with lice that I abandoned them to their fate. The extreme drouth of that season and the lice killed nearly every plant before the frosts came. My Swedes and cabbage were but little better.

This year, the first week in June, I carted upon a plot of grass land warm, fresh manure, at the rate of thirty cart-loads per acre, which was evenly spread and turned under by the plow from six to eight inches deep; the inverted sod was pressed down with a heavy roller, then well harrowed lengthwise the furrows; with a kind of horse rake drills were marked out at the distance of twenty-seven inches; a sprinkling of DE BURG'S superphosphate was deposited in the drills; seed sown by hand and covered by the use of a common hay rake. The plants came up in a few days and were not injured by the "fly" or "any other creature" through the season.

In July I commenced thinning the plants (feeding them to my cows morning and evening) till they averaged about two feet each way. This brought it up to sixty-five days from the time the land was plowed. At this time I cut at the surface of the ground every other plant on an average plot. The lightest plants weighed three pounds four ounces; the heaviest, nine and a quarter pounds; the whole number averaged a little over five and a half pounds per plant. There were fifty-six plants per square rod; but to be sure of not over-stating, I will call it fifty plants per square rod, which gives just twenty-two tons per acre of the choicest kind of green food for cows, etc., in less than sixty-five days from the time the seed was sown. I then commenced cutting the plants, twice daily, for my cows till they were used up (by which time I had a full supply of Early York cabbage to succeed as green food for my cows). Numerous sprouts sprang from the stumps, which produced several tons per acre of second crop. In cutting my rape plants, they were taken off at the surface of the ground. This was wrong. The stumps should have been left some four inches long, and then they would have produced a much larger second crop. The past season with us has been very wet and cool, perhaps much resembling the climate of England, which is much more favorable to the cabbage and turnip tribe of plants than our usually dry and hot summers.

In England and other portions of Europe, the rape plant is extensively cultivated both for green forage and for its seed, from which large quantities of oil are extracted for illuminating purposes. The rape cake (the refuse after the oil has been expressed) is a concentrated and a valuable manure, especially for the turnip plant.

Some two years since, a quantity of rape seed was imported by the light-house board, with a view of testing the practicability of cultivating the plant in this country for the purpose of manufacturing oil.*

Large quantities of this seed are annually imported into the United States at an expense of $3 or $4 per bushel, for feeding to cage birds.

When the plant is cultivated for its seed, it is sown in August, and blossoms and perfects its seed the following summer. I am doubtful whether the plants would survive the winters here at the north; but in the latitudes where the cabbage and turnip will withstand the winter, the seed might be profitably grown.

From the results of my experiment in growing the rape plant the past season, I think most farmers would find it for their interest to cultivate it for the succulent food which its thick, fleshy stems and leaves supply to cows when other green fodder is scarce. Perhaps the better way would be to sow a patch as early in May as the season will admit, and one or two later sowings, in June and July.

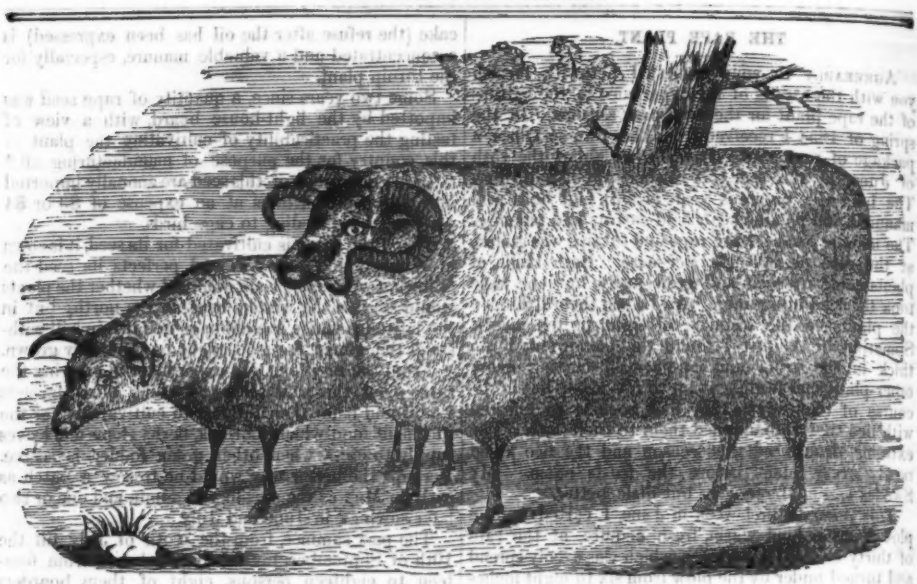
The past summer, from the tenth of July till the 10th of September, my family numbered from fourteen to eighteen persons, eight of them boarders from Boston. I kept but two cows—milk and cream were used with the greatest freedom—yet, during the two months we churned from four to six pounds of butter per week. The cows ran in an old wire-grass pasture that has been grazed over eighty years; but a wheelbarrow load of the rape plant, night and morning during the time, tells the secret of the story. LEVI BARTLETT—*Warner, N. H.*

SCARCITY OF FARM LABORERS IN ENGLAND.—The *London Farmers' Magazine*, in alluding to the difficulty of obtaining hands, says that "instead of two men looking after one master, two masters are looking after one man." The war has something to do with this, the improved condition of Ireland something, but emigration has been the great means of improving the condition of the farm laborers of England. The article alluded to says:

"Those districts which depended on a periodical influx of Irish laborers for their harvest, receive them no more. They have solved the problem of a self-supporting emigration. The Highlanders who performed in the same way the periodical labor of the Scottish lowlands are emigrating to Canada, where they can obtain land of their own. The English rural population are shaking off their dread of foreign parts. They are acquiring a better knowledge of them, and of the prospects they afford to the laboring man of becoming a land owner and employer of labor himself."

OF THE PLOWS AT THE PARIS EXHIBITION HORACE GREELY says: "The chief anxiety of the contrivers would seem to be that each should be thoroughly guarded, at whatever cost, against running too deep into the ground, though to that excess they manifest not the slightest inclination." We will venture to say that Mr. G. found little in European experience to sustain his *ultra* notions in regard to deep plowing.

* This seed was distributed and sent to various sections of the country through the agency of the Patent Office, each package accompanied with a circular, giving directions for its cultivation, etc.



BLACK-FACED RAM AND EWE.

THE SHEEP OF GREAT BRITAIN.

CHAPTER I.

THE BLACK-FACED SCOTCH OR HEATH BREED.

The origin of this breed of sheep is somewhat uncertain. It is found in the more northerly division of the chain of mountains which extend from the high lands of Derbyshire on the south to the confines of Scotland on the north. The elevation of this tract is from 1200 to 3000 feet. Prof. Low, in his work on the *Domestic Animals of the British Islands*, says:

"This breed possesses characteristics which distinguish it from every other breed in the British Isles. It is of the smaller races of sheep, with respect to the weight at which it arrives; but it is larger and more robust than the Zetland, the Welch, and the ancient soft-wooled sheep, which it displaced. It somewhat resembles the Wallachian; and as the latter has an affinity with the Persian, it may be conjectured that it is derived from the east. But it is more natural to assume that its peculiar characteristics have been communicated to it by the effects of food and climate, in the rough, heathy districts from which it is derived."

The characteristics of this picturesque breed readily distinguish it from the other breeds. Both the male and female have horns; very large, and spirally twisted with two or more curves in the male, but sometimes disappearing in the female. The limbs are lengthy and muscular, and the general form is robust; but the shoulders are not so low as in the Welch breeds, nor are the posterior limbs so long. The face is black, rather thick at the muzzle; the eye bright and wild; the body somewhat short and square. They are very active, of a hardy constitution, and well adapted to endure the privations and severe climate of the hilly districts in which they are kept. They have also the important property of finding a subsistance upon the heather in which the Highlands generally abound, and which affords them food even when the surface of the ground is covered with snow. Though a pure mountain breed, their habits are not so restless, and they are more docile than might be expected, and thrive well in the lowland inclosures where they are kept. The ordinary weight of the wethers, when killed at the age of four years, is fifteen pounds the quarter; but some are made to exceed this weight, when properly treated and sufficiently fed from an early age. The mutton is not so delicate as that of the Welch sheep or the South Downs, but it is more juicy, has more of the venison flavor, and is preferred to every other by those who are used to it. The mothers are good and hardy nurses, and are able to bring up their young, when they themselves have been exposed to severe privations. The *Farmer's Magazine* says:

"In snowy weather, this wild and hardy breed will dig up the snowy surface to reach the herbs beneath, and support life under circumstances in which the more delicate races would perish."

They do not, like the Welch sheep, prefer the summits of the mountains, but feed wherever pasturage can be obtained, and are not so nice in the choice of herbage as the South Downs, Merinos, and other races derived from countries yielding the finer grasses.

Latterly, considerable attention has been paid to this breed. Not only are the points and weight of the animal improved, but the fleece, which possessed certain defects, has been improved also. The wool, which is loose and shaggy, is lessened in value by the "kemps" or hairs mixed up in it. "These," says Prof. WILSON, "of course reduce the quality of the fleece, which can be used only for the coarsest goods. Good feeding, and a judicious selection in breeding from animals the most free from this defect, have already effected a marked improvement in this respect." The fleece, when washed, averages about three pounds.

Many crosses are met with between this breed and others, both long and short-wooled. "That with the long-wooled Leicester," says Prof. WILSON, "and with the short-wooled South Down, appear to be the most successful."

The ram and ewe which form the subject of the accompanying engraving, obtained the first prizes, in their respective classes, at the Fair of the Highland and Agricultural Society of Scotland.

FEEDING SHEEP IN WINTER.

LATE in the fall of 1854, JOHN JOHNSTON, Esq., of Fayette, Seneca county, N. Y., purchased 331 Spanish Merino sheep for $600. During the winter they were kept in a dry, warm, comfortable yard, and fed all the wheat and oat straw they would eat, and half a pound of oilcake, and three-fifths of a pound of corn per sheep per day. He sold them in the spring at $6 per head. The cost of oilcake and corn was $1.63 per sheep. This is great profit.

Mr. JOHNSTON prefers carefully selected Spanish Merino sheep to any other for feeding in this way.

Mr. J. W. COLBORNE, of Springfield, Vermont, states in the *Country Gentlemen* that he had 123 four year old wethers, a cross between the full blood Spanish Merino and Saxony, for which he was offered in November $2 per head, and his "neighbors considered it a very generous offer—it was all they would have brought at that time." He concluded to fatten them, and we give the result in his own words:

"I commenced feeding them with corn (unground) on the 24th of November, and followed it without change (except in quantity) until the 29th of March, when they went to Cambridge market, with the following results:

Sale of 123 head at $6.50 per head		$811 80
Value of sheep in November	$246 00	
20 tons English hay of good quality	200 00	
200 bushels corn at 80c. (the market price)	160 00	
Cost of getting them to market by railroad	44 28	
		$650 28
Profit		$161 52

Or a fraction over $1.31 per head.

The secret of this great profit in fattening sheep, is not merely in the increased weight of the sheep—not in real increase of mutton—but in the much higher price which good mutton commands in the spring than in the fall. Two dollars a head for these sheep in the fall would probably not have been, after deducting the value of the pelt, more than three cents per pound for the mutton; whereas, it is quite probable the mutton of these same sheep in the spring sold as high as nine or ten cents per pound.

We make these remarks to caution our readers against supposing that the above figures necessarily indicate great rapidity in fattening.

Mr. COLBURNE says:

"I commenced this flock of wethers with twenty quarts of corn per day, and from time to time increased gradually as they would bear it without producing the scours, until they would take seventy quarts per day, with as much good hay as they would eat without waste. It will not pay the cost and trouble to grind any kind of grain for sheep, though it always should be done for cattle or hogs. No whole grain passes the stomach of a sheep undigested."

Our experience in regard to feeding whole grain to sheep is in accordance with the above. The following remarks are also well worthy of attention:

"My sheep and cattle yards have open sheds with a southern or eastern exposure. Cattle are stabled nights, and mostly stormy days; sheep go out and in at their pleasure; pure aqueduct water in each yard, with a box of St. Ubes' salt constantly supplied, which I consider quite as essential in winter as in summer; yards and sheds kept dry by straw and other coarse litter. A large stable connected with my sheep yard enables me to shut them off when putting hay into their racks, or grain into their troughs, so that they all go to their feed together and share as equally as possible."

We shall be pleased to hear the experience of any of our readers who are in the habit of fattening sheep during winter—especially as to the rate of increase, and as to whether the Merinoes fatten as rapidly for the food consumed as the coarse-wooled breeds.

INFLUENCE OF THE MALE IN BREEDING.

THE last *Journal of the Royal Agricultural Society* of England contains a valuable article on the hereditary diseases of sheep and pigs, by FINLEY DUNN, of the Edinburgh Veterinary College. Mr. D alludes to what he terms an "ingenious hypothesis" which has been "lately propounded" by Mr. ORTON of Sunderland, but which, if we mistake not, we have before met with, though where, we cannot at the moment recollect. Mr. ORTON's main proposition is this:

"The male animal influences especially the external, and the female the internal organization of the offspring. The outward form, general appearance, and organs of locomotion are chiefly determined by the male; the vital organs, size, general vigor and endurance, by the female."

Mr. HARVEY, in commenting on Mr. ORTON's paper, makes, among others, the following remarks:

"The mule is the produce of a male ass and the mare; the *hinny*, (or as it is called the *mule*), that of the horse and the she-ass. Both hybrids are the produce of the same set of animals. They differ widely, however, in their respective characters—the mule in all that relates to its external characters, having the distinctive features of the ass—the hinny, in the same respects, having all the distinctive features of the horse; while, in all that relates to the internal organs and vital qualities, the mule partakes of the characters of the horse, and the hinny of those of the ass.

"Mr ORTON, speaking of this, says:—'The mule, the produce of the male ass and mare, is essentially a *modified ass;* the ears are those of an ass, somewhat shortened; the mane is that of the ass, erect; the tail is that of an ass; the skin and color are those of an ass, somewhat modified; the legs are slender, and the hoofs high, narrow, and contracted, like those of an ass; in fact, in all these respects it is an ass somewhat modified. The body and barrel of the mule are round and full, in which it differs from the ass and resembles the mare. The hinny, (or mato), on the other hand, the produce of the stallion and she-ass, is essentially a *modified horse;* the ears are those of a horse somewhat lengthened; the mane flowing; the tail is bushy, like that of the horse; the skin is fine, like that of the horse; and the color varies also like the horse; the legs are stronger, and the hoofs broad and expanded, like those of the horse. In fact, in all these respects, it is a horse somewhat modified. The body and barrel, however, of the hinny are flat and narrow in which it differs from the horse, and resembles its mother, the ass.'"

We may mention that VARRO, an ancient Roman writer alludes to the above fact as follows:—"A hinnus [the produce of a horse and an ass] is less than an ass in the body, commonly of a brighter color; his ears, mane, and tail like those of a horse. The mule [the produce of an ass and a mare] is larger than the ass, but has more of the characteristics of that animal in its parts than the hinnus."

Equally conclusive, although perhaps less striking instances, may be drawn from other sources. Thus it has been observed that when the Ancona or other sheep are allowed to breed with common ewes, the cross is not a medium between the two breeds, but that the offspring retains in a great measure the short and twisted legs of the sire.

Buffon made a cross between the male goat and ewe; the resulting hybrid in all the instances, which were many, were strongly characteristic of the male parent, more particularly so in the hair and length of leg. Curiously enough, the number of teats in some of the cases corresponded with those of the goat.

A cross between a male wolf and a bitch illustrates the same law; the offspring having a markedly wolfish aspect, skin, color, ears, and tail. On the other hand, a cross between the dog and female wolf afforded animals much more dog-like in aspect—slouched ears and even pied in color. If you look to the descriptions and illustrations of these two hybrids, you will perceive at a glance that the doubt arises to the mind in the case of the first, "What genus of *wolf* is this?"—whereas, in the case of the second, "What a curious *mongrel dog!*"

Mr. O. adduces facts to show that the same law holds good among birds and fish.

COST OF RAISING CATTLE.

IN the Agricultural Circular sent out from the Patent Office, farmers in various sections of the country were asked what it cost to raise cattle. We find in the last *Patent Office Report* the following replies:

Arkansas.—A. GORDON, of Lewisburg, Conway county, says:

"Cattle are raised at a cost of from $3 to $5 per head, at the age of three or four years."

Iowa.—J. W. RAYNOLDS, of Newbern, Mario county, says:

"The cost of raising a steer till three years old is $12."

Illinois.—E. BABCOCK, of Riley, McHenry county, says:

"Wild hay is generally worth, with us, about $2 per ton. One ton of hay per head, with the gleanings of the corn fields and corn shucks, and perhaps two bushels of corn each, is sufficient for the winter. Say $5 per head for winter keeping, and $1 more will cover all expenses for the year."

MARTIN MONDAY, of Vermillion county, Ill., says:

"The cost of raising a three year old steer is about $15."

Michigan.—C. F. MALLORY, of Romeo, Macomb county, says:

"Cost of raising till three years old, $5 a year."

Ohio.—S. S. G. FRANKLIN, of Cuba, Clinton county, says:

"The cost of raising a steer three years old is $24, or $8 a year."

New York.—LORENZO ROUSE, of Paris Hill, Oneida county, says:

"The cost of raising a steer till three years old would usually be about $25 to $30, but they are generally obtained by picking them up singly about the country, or by purchasing from droves which come annually from the west, usually from Ohio. Some of our farmers find a profit in stalk feeding their cattle in the winter, thereby not only making a home market for their root and grain crops, but greatly increasing their supply of manure. Success in either case will depend, as a matter of course, in a great degree on judgment in purchasing, skill in feeding, and frequently on luck in marketing."

S. A. COLLINS, of Sodus, Wayne county, N. Y., says:

"The cost of raising cattle till three years old is not far from $25 per head."

Maine.—FRANCIS FULLER, of Winthrop, Kennebec county, says:

"The cost of raising a heifer to the age of two years, or the period she first gives milk, is about $15. The cost of a steer at that age would be about the same."

Virginia.—Dr. H. M. PRICE, of Nicholas Cour House, says:

"The cattle of this county usually are sold to the "valley farmers," to be fattened for market, at four years old. The cost of raising to this age is about $2 or $3 a year."

Texas.—Z. P. WHARTON, of Egypt, Wharton county, says:

"We have no breeds of cattle except the Mexican stock, which the Americans found in the country when they first came here. The oxen are of large size and make good teams. The cows are good milkers. The beef of these cattle is very excellent. The cost of raising cattle on our prairies is almost nothing. At three years old they are worth $12 a head; at five years old, $16. Cost of driving to the Gulf markets, $1.50 per head. A few Durham bulls were brought into this vicinity from the Western States, but from the abundance of food they soon became so large and strong as to be dangerous to our herds, and were, consequently, shot. Therefore we had not an opportunity of ascertaining the results of a cross upon our common stock."

These are all the answers sent in on this subject. They are interesting certainly, but not sufficiently full and explicit to render them of any great value. The fact is, few farmers can make even an approximate estimate of the cost of raising cattle with any degree of certainty.

AN English farmer says "good sheds, *dry beds*, *small* yards or boxes, regularity in feeding, and *small* quantities at a time, are the great essentials in feeding all animals, and strict attention to these principles would save an immense quantity of valuable food."

SCOURS IN CATTLE.—A correspondent of the *Albany Cultivator* says that he had a cow which scoured badly, and thinking "she might as well die one way as another," he gave her "a handful of saltpetre," and she got better forthwith, and is now as well as ever.

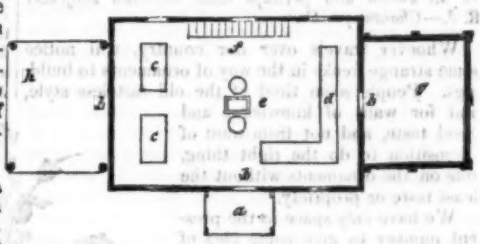
CHEESE DAIRY HOUSE.

CHEESE DAIRY HOUSE.

We should be glad if some of our correspondents would give us a description of some good dairy house, which has been found in practice to be adapted to the wants of butter and cheese making. Detached dairy houses are an "American institution." There are a few in the celebrated dairy district of Holstein, and other parts of the continent of Europe, but in England they are almost unknown. They possess many advantages over dairy rooms attached to the house, especially where a large number of cows are kept. The following description of one, taken from *Allen's Rural Architecture*, will, we hope, call attention to the subject, and induce some of our experienced correspondents to suggest improvements. We have seen dairy houses in the northern counties of this State which appeared to embody every improvement that could be thought of:

"This building is one and a half stories high, with a broad, spreading roof of 45° pitch; the ground plan is 10 feet between joists, and the posts 16 feet high. An ice-house is at one end, and a wood shed at the opposite end, of the same size. This building is supposed to be erected near the milking sheds of the farm, and in contiguity to the feeding troughs of the cows, or the piggery, and adapted to the convenience of feeding the whey to whichever of these animals the dairyman may select, as both, or either are required to consume it; and to which it may be conveyed in spouts from the dairy-room

"Interior arrangement.—The front door is protected by a light porch, (*a*), entering by a door (*b*) the main dairy room. The cheese presses (*c, c*) occupy the left end of the room, between which a passage leads through a door (*l*) into the wood shed, (*h*), open on all sides, with its roof resting on four posts set in the ground. The large cheese table (*d*) stands on the opposite end, and is 3 feet wide. In the center of the room is a chimney (*e*) with a whey and water boiler, and vats on each side. A flight of stairs (*f*) leading into the storage room above, is in the rear. A door (*b*) on the extreme right leads into the ice house (*g*). There are four windows to the room—two on each side, front and rear. In the loft are placed the shelves for storing the cheese, as soon as sufficiently prepared on the temporary table below. This loft is thoroughly ventilated by windows, and the heat of the sun upon it ripens the cheese rapidly for market. A trap-door through the floors, over which is hung a tackle, admits the cheese from below, or passes it down when prepared for market.



Ground Plan.

"The cheese house should, if possible, be placed on a sloping bank, when it is designed to feed the whey to pigs; and even when it is fed to cows, it is more convenient to pass it to them on a lower level, than to carry it out in buckets. It may, however, if on level ground, be discharged into vats, in a cellar below, and pumped out as wanted. A cellar is convenient—indeed, almost indispensable—under the cheese dairy; and water should be so near as to be easily pumped or drawn into the vats and kettles used in running up the curd, or for washing the utensils used in the work. When the milk is kept over night, for the next morning's curd, temporary tables may be placed near the ice-room, to hold the pans or tubs in which it may be set, and the ice used to temper the milk to the proper degree for raising the cream. If the dairy be of such extent as to require larger accommodation than the

plan here suggested, a room or two may be partitioned off from the main milk and pressing room, for washing the vessels and other articles employed, and for setting the milk. Every facility should be made for neatness in all the operations connected with the work.

Different accommodations are required for making the different kinds of cheese which our varied markets demand, and in the fitting up of the dairy house, no *positive* plan of arrangement can be laid down, suited alike to all the work which may be demanded. The dairyman, therefore, will best arrange all these for the particular convenience which he requires. The main plan and style of building, however, we think will be generally approved, as being in an agreeable architectural style, and of convenient construction and shape for the objects intended."

COUNTRY HOUSES—STYLES OF ARCHITECTURE.

Mr. Editor:—You will accept my thanks for those cheap plans for country houses you gave us in your November number, and the larger and more costly one in the December number. The fact is, on this subject we need information. Almost every one who builds now, undertakes to make a house different from the old style of buildings, and I have thought sometimes the great idea was to get something different from his neighbors. Now, I see in these new buildings many things that appear to me without design or object, a great display of gaudy ornaments, quite the opposite, I think, of neatness and good taste. And yet we are told, when calling in question the good taste of the builder, that this is the Gothic style, and that style requires just such ornaments; and the other is Grecian, and all right. Now if we knew anything of the history and distinctive character of these styles, we could use them properly, or condemn their improper use understandingly. I have no doubt the information I need is to be found in large and expensive volumes, but cannot you give us the cream of the thing in the *Farmer*, as we are apt to look to you for information on all *known* and perhaps some *unknown* subjects!

R. J.—*Chautauque Co.*

Whoever travels over our country, will notice some strange freaks in the way of ornaments to buildings. People seem tired of the old tasteless style, and for want of knowledge and good taste, and not from want of disposition to do the right thing, pile on the ornaments without the least taste or propriety.

We have only space in the present number to give some idea of the ornaments of the different styles, but in our next we will commence an article on the *Different Styles of Architecture—their Character, Changes, &c.* We take the following valuable hints on the subject of ornaments from *Repton's Landscape Gardening:*

"Of Ornaments, &c.—The English language does not admit of a distinction between those ornaments which comprehend utility, and those which are merely ornamental, or, rather, enrichments; thus, columns may be called architectural ornaments, but the sculptured foliage of the capitals are decorations and enrichments. In the progress of sculpture, we may trace it as an imitative art; from its origin, in the rude misshapen blocks of granite in Egypt, to its perfection, in the works of Greece, which are selected or combined forms of beauty, *ideal forms*, surpassing those of nature. We may, afterward, trace its decline, in the labored exactness of imitation, as in Chinese figures, where individual nature is so closely copied, that even *color* and *motion* are added to complete the resemblance.

"Much has been said, of late, concerning the study of nature in all works of art; but, if the most exact imitations of nature were the criterion of perfection, the man who paints a panorama, or even a scene at the theatres, would rank higher than Claude or Poussin. In that early stage of painting in England, when the exhibitions were first opened, they were crowded with portraits in colored wax, artificial flowers and fruits, and boards painted to deceive and surprise by the exactness of their resemblance; but they never excited admiration like the *marble* of Wilton, the wood carved by Gibbon, or the animated canvas of Reynolds. Mr. Burke observes, that 'it is the duty of a true artist to put a generous deception on the spectators;' but in too close an imitation of nature, he commits an absolute fraud, and becomes ridiculous, by the attempt to perform impossibilities. If it is the mark of a low imagination to aim at the *vastness of nature*, an endeavor to copy the *minutiæ of nature* is not less a proof of inexperience and bad taste, since both are equally inimitable.

'Si la Nature est grande dans les grande choses,
Elle est tres grande dans les petites.'

[If Nature is great in great things, she is very great in little ones.]

The model furnishes hints, not portraits; yet such is the love of exact imitation in common, minds that copies are made from copies, without end.

"For this reason, houses are built to resemble castles, and abbeys, and Grecian or Roman temples, forgetting their uses, and overlooking the general forms of each, while their minutest detail of enrichment is copied and misapplied. In works of art we can only use the *forms* of nature, not the *exactness*. Thus, in furniture, if we introduce the head or the foot of an animal, it may be graceful; but if we cover it with hair, or feathers, it becomes ridiculous. And in the parts taken from the vegetable kingdom, to enrich the ornaments of architecture, imitation goes no further than the general forms, since we scarcely know the individual plant; although some writers have mentioned the Reed, the Acanthus, and the Lotus.

Imaginary sketch, to show the forms of enrichment in Gothic architecture from the bud; Grecian from the leaf; and Indian from the flower.

"It is a curious circumstance, that the general forms of enrichments may be thus classed: The Gothic are derived from the *bud*, or *germ;* the Grecian from the *leaf;* and the Indian from the *flower;* a singular coincidence, which seems to mark that these three styles are, and ought to be, kept perfectly distinct.

To Darken Mahogany.—Drop a nodule of lime in a basin of water, and wash the mahogany with it.

Horticultural Department.

ORNAMENTAL PLANTING, &c.

Although we are forced to believe that horticultural taste is improving somewhat in this country, how few there are, of the many who undertake ornamental planting, that accomplish what they desire. In fact, a most lamentable ignorance upon this subject exists. Go where we may, abundant evidences attest this fact. Still, there is no country where such general desire exists among the people, to ornament and beautify one's home, as in this.

To succeed in improving a place, and making it attractive, as one wishes, the following must be done well:

1. Preparation of the Soil.
2. Laying out the Ground.
3. Selection of Trees.
4. Management after Planting.

Much depends upon the preparation of the soil, which, if poorly or imperfectly done, all after operations will be very unsatisfactory. The summer preceding the time that the ground may be wanted for planting, it should be graded, well drained, and subsoiled deeply, either with the plow or spade. If the ground is not already in good condition, it should be made so, by applying a thick coat of rich, well-rotted compost.

To produce the best results, great care must be taken in laying out the grounds properly. For extensive places, a person of experience in such matters should be sought; but in grounds of small dimensions—say half an acre or less—which must be very much lessened by walks, other modes may be adopted. In these cases, it would be well to give a sketch of the lot and buildings, with distances, and submit it to some person who has had experience in such matters. The suggestions he might make would go far toward accomplishing what you desire, and would perhaps save much expense.

A proper selection of trees requires a general knowledge of plants, their habits, etc., which is acquired thoroughly only by constant and close observation for years. It is all important, too, to know what plants will thrive well in certain localities and situations, and what will not. A very suitable person from whom to obtain this information, would be a professional European gardener who has had some years experience in this country; or some private person who under his personal supervision has a varied collection of ornamental trees, shrubs, etc. But a nurseryman who is dealing considerably in such plants, would be good authority, as he has most abundant means at hand to inform himself, and is in constant communication with parties residing throughout the different parts of the United States and has a better opportunity of knowing the results of the experience of others than most persons. The proper trees and plants for certain situations—in fact, a particular place for every plant—what should be placed here to hide an unpleasant object, what there to produce an agreeable effect, and every other detail—should be determined upon before a single article is ordered.

Planting *too close* is the great fault with nearly every planter; not enough space is allowed for the plants to grow. *Immediate* effect governs such, when they ought to look far enough in the future to judge what would be the appearance of their grounds in ten, fifteen, or twenty years hence.

All plants, unless set out for hedges, screens, or for clumps, should be placed far enough apart to give ample room for each plant to unfold itself, presenting at one view a finely-formed, well-grown plant. One of our most common plants, when well developed, is much more an object of admiration than would be hundreds of more rare plants crowded together within a small space.

The after treatment which should be given plants, differs somewhat—some requiring pruning, others staking and training; but all want good, deep cultivation, and the ground about the plants should be kept free from weeds, and every autumn apply a top-dressing of manure, which should be spaded or forked into the ground the following spring.

There are few persons who can be induced to wait—things must be done upon the go ahead principle. In this way, scarcely one in ten accomplish the object they undertake. The desire to ornament and beautify their grounds, is particularly strong after completing a new house, or remodeling an old one. Liberality is his motto. Catalogues—almost books in size—of extensive nursery establishments, reach him per return mail. His former ignorance of names and the characters of ornamental trees and plants is not removed by reading over and over the descriptions of perhaps hundreds of varieties, and in despair he selects plants quite indiscriminately, amounting to as many dollars as he is inclined to expend. The nurseryman fills the order, and probably with well grown, fine plants; but our new planter's ideas, with hardly an exception, differ widely from those of the nurseryman. He is disappointed at the start. The plants he has received look much different from what he expected, in almost every particular. The plants in pots he expected, from the price, would be almost trees in size; in fact, inches ought to be feet. But in some things the price and plants tolerably correspond. The nurseryman is thought hardly honest, and our planter votes at once that he has been deceived, and seriously thinks it is a duty he owes the public that the treatment he has received should be exposed. He finally concludes that instead of throwing the plants over the fence, he will plant them after his original design. They are soon planted; and fully as little judgment has been given the preparation of the soil as there was displayed in selecting the plants. The ground is perhaps undrained, and certainly not subsoiled or trenched. And then to produce, as it were, the finishing touch, plants that require fully a space of twenty to thirty feet, must be content with four to

six. The results are, as would naturally be supposed, the shrubs, &c., make feeble, slender growth; some die after the first summer; and even then, part of the more robust-growing plants within three years so trespass upon each other as to make them unsightly. It would be considered almost sacrilege to thin them by taking out some and giving more room to the others, so they are allowed to flourish as they can, which renders them more and more unsightly the longer they are allowed to remain. This is not the case with one only, but such is the experience of hundreds. There is, however, much information of this kind which is being diffused among the people; so that before many years shall have passed, the plea of ignorance will hardly be considered a sufficient excuse.

THE WAY TO GROW GOOD CELERY.

If you have the convenience of a green-house, take (about the first of March) a box, say two feet square and six inches deep, bore five or six holes in the bottom, and fill one inch deep with broken charcoal or broken potsherds for drainage, then fill the box three inches deep with light, rich soil—if one-third of it be leaf mold and lake or river sand so much the better—press the soil down firmly with the hand so as to leave it about four inches deep, drainage and all, make the surface of the soil smooth and even, then sow seed of *Seymour's Superb White* and *Seymour's Superb Red* celery; barely cover the seed with fine earth, and press it all down gently with a piece of board or the bottom of a flower pot; water it gently, and cover the box with some pieces of glass. Place it in the warmest part of the green-house, and shade it with a piece of newspaper in bright, sunny days.

If you have not a green-house, make a small hot-bed, about the first of April. This will be soon enough, for it will be very difficult to keep up a heat earlier than this. If the manure to be used be fresh and rank from the stable, it should be prepared by shaking and mixing and throwing it up in a heap to ferment and pass off the rank steam, ten days or a fortnight before it is wanted to make up the hot-bed. The hot-bed is made by throwing up manure into a heap three feet high and one foot larger every way than the box which is to stand upon it. In making the hot-bed the manure should be well mixed and beaten down with the back of the fork, not trodden with the feet, for when trodden it will heat unevenly, and when beaten down with the fork it will heat evenly and all settle down together. When the hot-bed is made and the box placed on it, put in about four inches deep of light, rich garden mold; then put on the sash and cover it with some old mats or dry litter for three days; at the end of the third day examine the bed, and if very hot leave the sash tilted at the back about one inch all night to let off the rank steam. The next day level the earth and sow the seed as recommended for the box in the green-house. Keep it covered in cold nights and shaded from hot sun until the plants get two or three inches high; then admit more air in warm days to harden them off. If there should be more room in the bed than is wanted for the celery, it can be filled up with early cabbage, cauliflower, lettuce, tomatoes, etc. When the mold looks dry water lightly with warm water. The temperature of the water should be between 75° and 85°, and this is about the right temperature of the hot-bed. The first week in May, if the celery has grown pretty well, it will be three or four inches high, and will be ready for transplanting, or pricking out, as gardeners term it. To do this, I dig a pit one foot deep, four feet wide, and any length that may be necessary to receive the required number of plants. The earth that is thrown out of the pit is thrown all round it, so as to leave it when cleaned out two feet deep; I then fill this pit eighteen inches deep with well-fermented stable manure. If the manure is dry by over-heating, I give it a good watering and shake it up well, shaking and mixing it as I put it into the pit, and beating it down with the back of the fork. This done, if you have not a spare hot-bed frame, place some boards all around the pit and put on about four inches deep of light, rich garden earth; and when nicely warmed through, take a market basket and a common three-pronged dinner fork and take up the plants carefully from the seed-bed, without breaking, and with a little ball of earth about their roots, if possible. Then with a small garden trowel dig holes four inches apart each way in the new bed, and put one plant into each hole, pressing it down firmly with the fingers. When all are planted, give water enough to settle the earth about their roots. The temperature of the water should be between 75° and 85°; for celery can no more bear with impunity the sudden transition from heat to cold, than ice can the transition from cold to heat.

About the 10th of June I prepare my celery trenches. To do this well, I dig a trench two feet wide and one foot deep, throwing the earth alternately on each side of the trench. When the trench is made I wheel in enough manure from old hot-beds to fill the trench six inches, and dig it in, mixing it well with the soil. When all is dug, smooth it with the back of the rake. I am aware that many people think that one foot wide and one foot deep is enough for a celery trench, but it is *not* enough in width, for it will be found on examination that celery sends its roots more laterally than in a downward direction before earthing up, and after earthing up it actually throws its roots up into the bank; therefore I consider it better not to begin to earth up too soon. A very prevailing way of making celery trenches is to dig the trench eighteen inches wide and one foot deep, beveling down the sides, making a complete gutter, and planting the celery along the bottom;—consequently the earth is always pulverizing and running down with every heavy rain into the hearts of the plants, rotting them or materially checking their growth; hence we see so many uneven rows of celery.

If the weather should be wet or cloudy about the 10th of June I plant out at once. I take them up carefully with as large a ball of earth as will adhere to their roots, planting it entire, first picking off all the small leaves and suckers around the base of the plant, should there be any. For my late and winter celery I plant about one foot apart in the rows—that to be used earlier about nine inches. When planted give them a thorough soaking of water. If the weather should be, and continue to be, hot and dry for some time, I give them a good soaking of water once or twice a week, using all the soap-suds and *clear* manure water that I can get. Do not be afraid of giving too much water at this time of year to celery; if you literally flood the trenches once or twice

a week for three or four weeks, it will do a great deal of good, providing you do not wash the earth into the hearts of the plants.

If the first celery is wanted for use by the middle of September, I begin by the middle of August to earth up that planted nine inches apart. To do this I take each plant separately and pick off all the small bottom leaves and suckers, if there be any; then straighten up the leaves of each, holding them tightly in one hand while I tie a piece of matting around them with the other, keeping the heart in the middle. When all are tied up in this way, if dry weather, I give a right good soaking of water, and fill in the earth about three or four inches, or just as high up as the crowns of the plants, but no higher; then take a knife and cut all the strings. They should be earthed up in this way about every fortnight or three weeks at most. The earthing up of the late celery, or that to be used in winter, need not be commenced before the first week in October; then to be earthed up at intervals of two or three weeks, as recommended above, but with a little more care, the leaves being longer and stronger, and having spread out on the surface of the ground, will be more difficult to get up without breaking. About the middle of November, or just before severe weather is expected, bank up those rows that are to stand out all winter. Make the bank at least eighteen inches thick at bottom and one foot thick at top on each side of the plants, leaving the whole bank three feet thick at bottom and two feet thick at top, and nearly as high as the top of the leaves. When this is done, if cold weather is likely to set in, cover the whole top with clean, dry straw, and lay boards on the straw in such a position as to shield the plants from the snow and wind as much as possible. All this should be done before any severe frost touches them; for although it takes a great degree of cold to *kill* celery, but little will suffice to destroy its flavor. Just the last thing before winter is expected, take up a good supply and pack in the cellar or woodshed or any place where it will not freeze or be heated over 40°. When taken up strip off any broken leaves and trim off any loose roots; then tie each plant round with a small piece of bass matting to prevent the leaves from breaking and the dirt from getting into the hearts of them. The best place to keep the plants, in my opinion, is one corner of a cellar;—place a board to keep the earth up, then place the plants upright as closely as they will stand and fill in between them with moist, clean sand, if to be had readily, if not, fine earth will do. When this supply is gone, or the weather breaks up, get in another supply. Celery may be kept in this way fresh and good until the last of March or beginning of April. J. Salter, *Gardener to John F. Bush, Rochester, N. Y.*

Fruit Growers' Society of Western New York.—The Annual Winter Meeting of this Society will be held at the Court House, in Rochester, on Tuesday and Wednesday, January 8th and 9th, 1856, at which an exhibition of Winter Fruits will be made. An interesting discussion on fruit growing will take place, and new and valuable information be given. Contributions of fruit are desired, and particularly specimens of the newer varieties.

All the members, and every other person interested, residing in the twenty-three western counties, and elsewhere, are cordially invited to attend.

PRODUCTIVE AND PROFITABLE PEAR TREES.

Forty Dollar Pear Tree.—Mr. C. A. Nealey, formerly a resident of this town, but now a farmer of Eddington, in Penobscot county, hauled into the village last Tuesday morning, forty bushels of pears, and in one hour retailed all of them from his wagon at two dollars a bushel. The pears were of a superior quality, and bought expressly for making preserves. Mr N. informed us that he gathered twenty bushels of this lot from one tree. We should think that the farmers in this region might take the hint—it costs but a trifle to grow the trees.—*Ellsworth* (Maine) *American.*

This is pretty good for Maine, but it is not ahead of Western New York, as witness the following:—In the *Albany Cultivator* for 1852, page 373, it is said that "Wm. S. Lapham, of Macedon, N. Y., has a pear tree standing in a corner of his house-yard, which is probably over twenty-five years old, and which yielded the present year *fifteen bushels* of fine, smooth pears, which sold on the ground at two and a quarter dollars per bushel, or about $34 for the crop." In the same neighborhood, the *Cultivator* adds, Israel Delano "gathered from two trees of the *Virgalieu*, forty-two bushels of pears, all of which were sold at two and a quarter dollars per bushel, or $94 for the two."

At one of the pomological meetings held during the New York State Fair, in 1853, mention was made of "an old tree growing in Western New York, which had annually yielded from $20 to $30 worth of pears, at two and a half dollars per bushel."

The Ohio Pomological Society.—This society will hold its regular *Biennial Session* on the second Tuesday in January, (the 8th), in the city of Cleveland, and continue in session so long as the interest of the same may require.

The society, though instituted for the region of Ohio, nevertheless of necessity takes in the wider range of our country—in view of which a resolution was unanimously passed that all fruit growers and pomologists out of the State be invited.

Communications may be addressed to the President or the Secretary. Packages of specimens of fruit should be marked "For the Pomological Society," and directed to the "Care of F. R. Elliott, Cleveland, Ohio," to whom members and others will report themselves to learn the place of meeting and for other information.

ON THE AGE OF TREES.

In speaking of the age of trees, we insensibly use the term age in the same manner as we do when speaking of animals. We talk of old trees, old animals, and old houses, as if the same processes had gone on in one as in the other. Yet, when we come to examine the nature of the changes which have taken place during the age of the one and the other, how different they are. Not more does the process of change in the old house differ from the tree and animal, than does the same process in these two. The animal has but one life, and this life is dependent on the harmony of the whole organization; whilst, if we examine a tree, we shall find it has, (so to speak,) many lives. Each bud is capable of an independent existence; nay more, many parts of the tissues of plants are capable of producing buds, and each cell has its separate and independent existence. It is here, then, that we see how different must be the circumstances under which age is

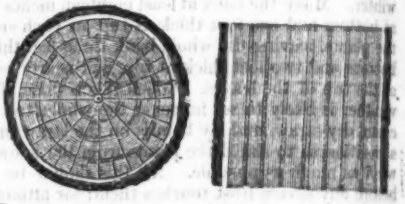
attained in a tree, from those which produce it in an animal.

Plants are called annual, biennial, or perennial, as they endure for one, two or more years. The difference depends on this, that the tissues of some plants are unable to resist the meteorological influences to which they are exposed, so well as others. The reason of this difference in the tissues is not well made out. It is, however, well known, that a plant in this country may be an annual, on the Continent, a biennial, and, in the Tropics, a shrub, or tree. This is the case with the castor-oil plant, *Ricinus communis*.

Beech Tree—Exogen.

Agave American—Endogen.

In perennial plants, the tissues which resist climatal change carry on a kind of low vitality, as seen in the trunks of trees, in this country, in the winter. At more favorable periods, these tissues begin to grow in certain directions; buds, and leaves, and new tissues are formed, and deposited, in various parts of the plant, more especially covering the old, and growth or increase is the consequence. Even in plants not producing leaves, this process goes on, and year after year, new tissues are added to the old. This is especially evident in sea-weeds, which thus exist through very long periods of time. Thus, Professor Schleiden says, "On the great fucus bank of Corvo and Flores, we might yet find, floating about, plants of *Sargassum*, which had been cut in strips by the bark of Columbus; and in the northern drift, we might expect to discover Lichens that had been transported with the soil in which they grew, from Scandinavia." Nor is this conjecture at all unreasonable, from what we know of the nature of the process of growth in these plants; but we have no means, in cryptogamic plants, of accurately ascertaining the length of time they have been growing. Nor is this possible in endogenous plants, or even in all exogens; but in the latter, the stem presents, very generally, a series of zones, and each zone has been found to correspond with one period of vegetation. This period mostly represents a year, hence, by counting the number of zones in the trunk of an exogenous tree, we may form an estimate of the years it has existed. It is in this way that the ages of many very old trees have been arrived at. The following list of old trees has been published by Moquin-Tandon, in his *Teratologie Vegetale*, and is reproduced in the English translation of *Schleiden's Principles of Scientific Botany*. There are known,



Sections of a Stem as it appears in May and June of the Fifth Year. The white spaces show the swelling cambium.

Sections of a Stem at the end of the Fifth Year. The envelopes and layers of liber are too thin to be shown by the pencil.

	Years
Palms of	200, 300
Cercis	360
Chetodendron	327
Ulmus (Elm)	365

	Years.
Cupressus (Cypress)	888
Hedera (Ivy)	448
Acer (Maple)	516
Larix (Larch)	562, 576
Castanea (Chestnut)	800, 626
Citrus (Lemon, Orange, &c.)	400, 502, 540
Platanus (Plane)	720
Cedrus (Cedar)	800, 900
Juglans (Walnut)	900
Tilia (Lime)	364, 630, 900, 625, 1036
Abies (Spruce)	1200
Quercus (Oak)	600, 800, 860, 1600, 1600
Olea (Olive)	700, 1000, 2000
Taxus (Yew)	1214, 1466, 2588, 2880
Schubertia (Taxodium)	3000, 4000
Leguminosæ	2052, 4104
Adansonia (Baobab)	6000
Dracæna (Dragon Tree)	6000

We might add considerably to this list, but it already supplies a sufficient number of illustrations of our general remarks.

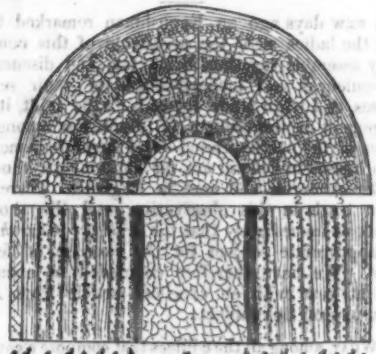
The means, by which the age of these trees has been ascertained, are two—first, from historical data, and second, from counting the zones. Thus, the colossal Dragon-tree of Oratava is known to have existed, in almost its present condition, in 1402; and comparing it with the younger trees in its neighborhood its vast age is inferred. The Yew trees at Fountain's Abbey, in Yorkshire, are known to have sheltered the monks whilst the abbey was building. The abbey is now in ruins, but the trees retain their vigor; the lowest age that can be assigned them is twelve centuries; they are probably much more. But where trees have been cut down, the method of counting zones has been had recourse to. There is no difficulty in this where the tree is sound; but in many instances, the older trees are, the more likely they are to be decayed in their center. The plan then adopted is, to take a square inch, count the zones in it, multiply this number by the number of inches from the bark to the pith, which will then give the whole number of zones, and the age of the tree. This was the plan adopted by ADANSON in calculating the age of the Baobabs of Africa, and which has also been employed in calculating the age of other gigantic trees. The numbers, however, thus obtained, can only be looked upon as approximations to the truth, seeing that the zones of wood vary very much in thickness, not only one with the other, but in parts of the same ring.

Size is no indication of the age of a tree, as various species grow at very different rates, and the same species under different circumstances. The following table shows the different rates at which some common trees grow.

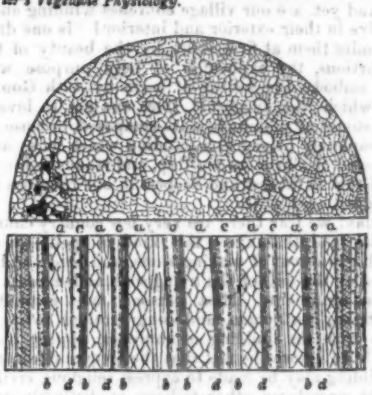
	1st Year.	2d Year.	3d Year.
	Ft. In.	Ft. In.	Ft. In.
Oak, circumference,	0 10¾	0 11¾	1 0¾
Larch "	1 0¾	1 8	1 4
Elm "	2 7¾	2 9	2 11
Lombardy Poplar "	1 8	2 0	2 3¾
Lime "	1 8¾	1 10¾	2 0

Some trees attain an enormous size by their rapid growth. Species of *Eucalyptus* have been measured that reached a height of 250 feet, and measured 70 feet round their trunks.

The death of trees does not appear to arise from any natural period being assigned to the existence of their living tissues, or reproductive powers. When the tissues of a tree are very old, they lose their vitality, especially in the center of the trunks of the trees; and, on being exposed to the atmosphere, or moisture, they readily decay. The process of new growth is sometimes more rapid than this decay, and thus trees exist with enormous cavities in their interior. The time, however, comes, sooner or later, when a separation takes place between the roots and branches, and then the tree ceases to exist, although the tissue that has been conveyed away from it, in the form of slips and grafts, may still continue to flourish. Thus, the old stump of the *Ribstone Pippin* Apple is but struggling for life in *Ribstone* Park, while the slips from its branches adorn a thousand orchards, and supply the thousands upon thousands of bushels of *Ribstone Pippin* Apples that are annually consumed.



HORIZONTAL OR TRANSVERSE AND PERPENDICULAR SECTION, OF THE STEM OF AN EXOGEN OF THREE YEAR'S GROWTH. In the center *a* each is seen the pith, *a*, composed of cellular tissue; surrounding it is the medullary sheath, *b*; and exterior to it are three rings of wood, each consisting of *c*, *c*, dotted ducts, and *d*, *d*, woody fibre. The last formed is in contact with the bark, *e*, *e*, in which the layers are indistinct. *Carpenter's Vegetable Physiology.*



HORIZONTAL AND VERTICAL SECTION OF THE STEM OF AN ENDOGEN, showing the bundles of ducts, woody fibre, and spiral vessels, irregularly disposed through the whole stem. *a*, *a*, portions of cellular tissue; *b*, *b*, spiral vessels; *c*, *c*, dotted ducts; *d*, *d*, woody fibre. The cellular portion of the skin, which in Exogens is separated by the first introduction of wood into pith and bark, here remains permanently intermingled with it.

[The accompanying engravings, representing sections of Exogen and Endogen, will explain themselves. The number of zones in trees will probably give a tolerable approximation to the years of growth in temperate climates; but even here, two may be formed in one year, if any great check of the growth suddenly occurs during the summer. In tropical climates the indication is far more doubtful; ADANSON's computation, made in this way, carried the age of the Baobabs to from 5000 to 6000 years. It has been stated that monthly rings are formed in the trunks of South America. (*Hopkins Researches in Magnetism.*) Some plants, such as the Cacti and Cycadem, require more than one year for the formation of a zone of wood.]—*London Gardeners' Magazine of Botany.*

Ladies' Department.

DESIGNS FOR COUNTRY CHURCHES.

A FEW days ago an Englishman remarked to us that the ladies were the architects of this country. They assemble together, drink tea, and discuss the conveniences and inconveniences of their several houses, and when a new house is to be built, its arrangement is the subject of discussion among the ladies of the neighborhood—and therefore American farm houses in general are far superior to those of similar character and cost in England. There was much truth in this observation, and the thought struck us immediately that the *Village Church* was an appropriate subject for the exercise of female taste. We have therefore concluded to open the present year with an excellent article from A. J. DOWNING on this subject:

"WHAT, among all the edifices that compose a country town or village, is that which the inhabitants should most love and reverence,—should most respect and admire among themselves, and should feel most pleasure in showing to a stranger?

"We imagine the answer ready upon the lips of every one of our readers in the country, and rising at once to utterance, is—the VILLAGE CHURCH!

"And yet, are our village churches winning and attractive in their exterior and interior? Is one drawn to admire them at first sight, by the beauty of their proportions, the expression of holy purpose which they embody, the feeling of harmony with GOD and man which they suggest? Does one get to love the very stones of which they are composed, because they so completely belong to a building which looks and is the home of Christian worship, and stands as the type of all that is firmest and deepest in our religious faith and affections?

"Alas! we fear there are very few country churches in our land that exert this kind of spell,—a spell which grows out of making stone, and brick, and timber, obey the will of the living soul, and express a religious sentiment. Most persons, most committees, selectmen, vestrymen, and congregations, who have to do with the building of churches, appear indeed, wholly to ignore the fact that the form and features of a building may be made to express religious, civil, domestic, or a dozen other feelings, as distinctly as the form and features of the human face;—and yet this is a fact as well known by all true architects, as that joy and sorrow, pleasure and pain, are capable of irradiating or darkening the countenance. Yes, and we do not say too much when we add, that right expression in a building for religious purposes, has as much to do with awakening devotional feelings, and begetting an attachment in the heart, as the unmistakable signs of virtue and benevolence in our fellow creatures have in awakening kindred feeling in our own breasts.

"We do not, of course, mean to say, that a beautiful rural church will make all the population about it devotional, any more than that sunshine will banish all gloom; but it is one of the influences that prepare the way for religious feeling, and which we are as unwise to neglect as we should be to abjure the world and bury ourselves like the ancient troglodytes, in caves and caverns.

"To speak out the truth boldly, would be to say that the ugliest church architecture in christendom, is at this moment to be found in the country towns and villages of the United States. Doubtless the hatred which originally existed in the minds of Puritan ancestors against everything that belonged to the Romish Church, including in one general sweep all beauty and all taste, along with all the superstitions and errors of what had become a corrupt system of religion, is the key to the bareness and baldness and absence of all that is lovely to the eye in the primitive churches of New England—which are, for the most part, the type churches of all America.

"But, little by little, this ultra puritanical spirit is wearing off. Men are not now so blinded by personal feeling against great spiritual wrongs as to identify forever all that blessed boon of harmony, grace, proportion, symmetry, and expression, which make what we call beauty, with the vices, either real or supposed, of any particular creed. In short, as a people, our eyes are opening to the perception of influences that are good, healthful, and elevating to the soul, in all ages, and all countries—and we separate the vices of men from the laws of order and beauty by which the universe is governed.

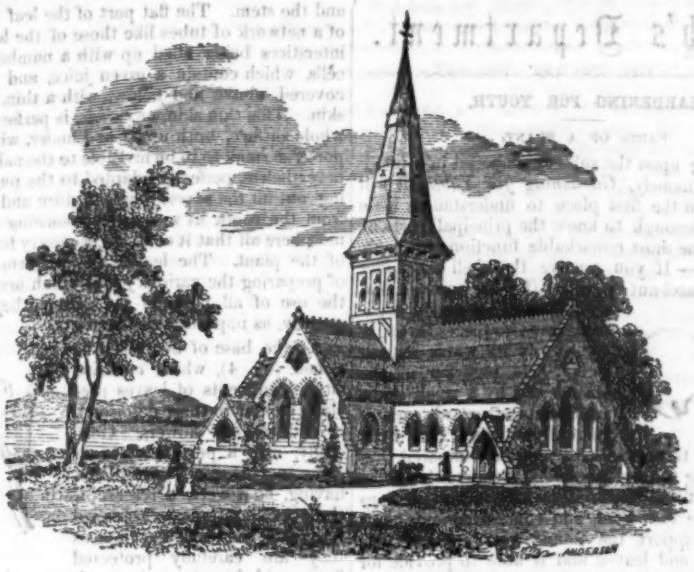
"The first step which we have taken to show our emancipation from puritanism in architecture, is that of building our churches with *porticoes*, in a kind of shabby imitation of Greek temples. This has been the prevailing taste, if it is worthy of that name, of the Northern States for the last fifteen or twenty years. The form of these churches is a parallelogram. A long row of windows, square or round-headed, and cut in two by a gallery on the inside; a clumsy portico of Doric or Ionic columns in front, and a cupola upon the top, (usually stuck in the only place where a cupola should never be—that is, directly over the pediment or portico)—such are the *chef d'œuvres* of ecclesiastical architecture, standing, in nine cases out of ten, as the rural churches of the country at large.

"Now, *architecturally*, we ought not to consider these *churches*, at all. And by churches, we mean no narrow, sectarian phrase, but a place where Christians worship GOD. Indeed, many of the congregations seem to have felt this, and contented themselves with calling them "meeting houses." If they would go a step farther, and turn them into *town-meeting houses*—or at least would in future only build such edifices for town meetings or other civil purposes, then the building and its purpose would be in good keeping, one with the other.

"Not to appear presumptive and partial in our criticism, let us glance for a moment at the opposite purposes of the Grecian or classical, and the Gothic or pointed styles of architecture—as to what they really mean; for our readers must not suppose that all architects are men who merely put together certain pretty lines and ornaments to produce an agreeable effect and please the popular eye.

"In these two styles, which have so taken root that they are employed at the present moment all over Europe and America, there is something more than a mere conventional treatment of doors and windows;—the application of columns in one case, and the introduction of pointed arches in the other. In other words there is an intrinsic meaning or expression involved in each, which not to understand, or vaguely to understand, is to be working blindly, or striving after something in the dark.

"The leading idea of the Greek architecture, then, is in its horizontal lines—the unbroken level of its cornice, which is the "*level line of rationality*." In this line, in the regular division of spaces both of columns and windows, we find the elements of order, law, and human reason fully and completely expressed. Hence the fitness of classical architecture for the service of the State, for the town hall, the legislative assembly, the lecture room, for intellectual or scientific



DESIGN FOR A COUNTRY CHURCH.

debate, and in short, for all civil purposes where the reason of man is supreme. So, on the other hand, the leading idea of Gothic architecture is found in its upward lines—its aspiring tendencies. No weight of long cornices or flat ceilings can keep it down; upward, higher and higher, it soars, lifting everything, even heavy, ponderous stones, poising them in the air in vaulted ceilings, or piling them upwards towards Heaven, in spires, and steeples, and towers, that, in the great cathedrals, almost seem to pierce the sky. It must be a dull soul that does not catch and feel something of this upward tendency in the vaulted aisles, and high, open, pointed roofs of the interior of a fine Gothic church, as well as its subdued and mellow light, and its suggestive and beautiful forms; forms, too, that are rendered more touching by their associations with Christian worship in so many ages; not, like the Greek edifices, by associations with heathen devotees.

"Granting that the Gothic cathedral expresses in its lofty, aspiring lines, the spirit of that true faith and devotion which leads us to look upward, is it possible, in the narrow compass of a village church which costs but a few hundred, or at most, a few thousand dollars, to preserve this idea?

"We answer, yes. A drop of water is not the ocean, but it is still a type of the infinite; and a few words of wisdom may not penetrate the understanding so deeply as a great volume by a master of the human heart, but they may work miracles, if fitly spoken. For it is not the magnitude of things that is the measure of their excellence or power; and there is space enough for the architect to awaken devotional feelings and lead the soul upward, so far as material form can aid in doing this, though in a less degree, in the little chapel that is to hold a few hundred as in the mighty minster where thousands may assemble.

"And the *cost*, too, shall not be greater; that is, if a substantial building is to be erected, and not a flimsy frame of boards and plaster. Indeed, we could quote numberless instances where the sums expended in classical buildings of false proportions, but costly execution,* which can never raise other than emotions of pride in the human heart, would have built beautiful rural churches, which every inhabitant of the town where they chanced to stand would remember with feelings of respect and affection to the end of all time.

"And in truth, we would not desire to make the country church other than simple, truthful, and harmonious. We would avoid all pretensions to elaborate architectural ornament; we would depend upon the right proportions, forms, outlines, and the true expression. Above all, we would have the country church rural and expressive, by placing it in a spot of green lawn, surrounding it with our beautiful natural shade trees, and decorating its *walls* (for no church built in any but the newest settlements, where means are utterly wanting, should be built of so perishable a material as wood) with climbing plants—the ivy, or where that would not thrive, the Virginia creeper. And so we would make the country church, in its very forms and outlines, its walls and the vines that enwreath them, its shady green and the elms that overhang it, as well as in the lessons of goodness and piety that emanate from its pulpit, something to become a part of the affections, and touch and better the hearts of the whole country about it.

FURNITURE PASTE.—Put turpentine into a glazed pot, and scrape beeswax into it, which stir about till the liquid is of the thickness of cream; it will then be good for months, if kept clean; and furniture cleaned with the liquid thus made, will not receive stains so readily as when the turpentine and wax are heated over the fire; which plan is, besides, very dangerous; but if the heating be preferred, place the vessel containing the wax and turpentine in another containing boiling water.—*Household Receipt-Book.*

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* We have seen with pain, lately, one of these great temple churches erected in a country town on the Hudson, at a cost of $20,000. It looks, outside and inside, no more like a church than does the Custom House. And yet this sum would have built the most perfect of devotional edifices for that congregation.

Youth's Department.

GARDENING FOR YOUTH.

PARTS OF A PLANT.

On entering upon the subject proposed in a previous number, namely, *Gardening for Youth*, it will be necessary in the first place to understand a little botany—just enough to know the principal parts of a plant, and the most remarkable functions for each.

The Seed.—If you remove the shell and inner skin from a hazel-nut or filbert (fig. 1), you will find that the kernel easily separates into two pieces throughout nearly its whole extent, being held together at the smaller end by a small body, which tapers towards each of its extremities. This little body is called the *germ*, and may be compared to a bud containing the rudiments of a tree like that from which the nut was taken. The two larger portions are termed the *seed-lobes*, and contain enough nourishment to support the young plant until it has formed roots and leaves, and is able to provide for itself. The kernel, or seed, has no tendency in itself to alter its form, if kept dry and exposed to light; but if buried a little way beneath the surface of damp earth, it swells and bursts its coverings; the seed-lobes are changed into green fleshy leaves, and between them the germ lengthens upwards and downwards, expanding first one *leaf* and then another, and sending out from its lower end downy fibres or *roots*. All the nourishment which it receives at present, is derived from the enlarged seed-lobes, called *seed-leaves* in this stage of their growth; consequently, if they are destroyed, the young plant perishes likewise.

Fig. 1.

The *true leaves*, which shoot up between the seed-leaves, are generally different in form from the seed-leaves, as may be observed in the young cabbage plant (fig. 2.) They usually consist of two parts (fig. 3); the *leaf-stalk*, which is a collection of tubes inclosed in a thin rind, and destined to convey juices and air upwards and downwards between the leaf and the stem. The flat part of the leaf is composed of a network of tubes like those of the leaf-stalk, the interstices being filled up with a number of minute cells, which contain a green juice, and the whole is covered, above and below, with a thin, transparent skin. This thin skin, or *cuticle*, is perforated over its whole surface, both upper and under, with numerous pores, so small as to be invisible to the naked eye; but, nevertheless, perfectly adapted to the purpose of giving out all the superfluous moisture and air received from the roots, as well as of absorbing from the atmosphere all that it contains necessary for the growth of the plant. The leaves also perform the function of preparing the various juices which are destined for the use of all parts of the plant; they are, consequently, as important as the roots.

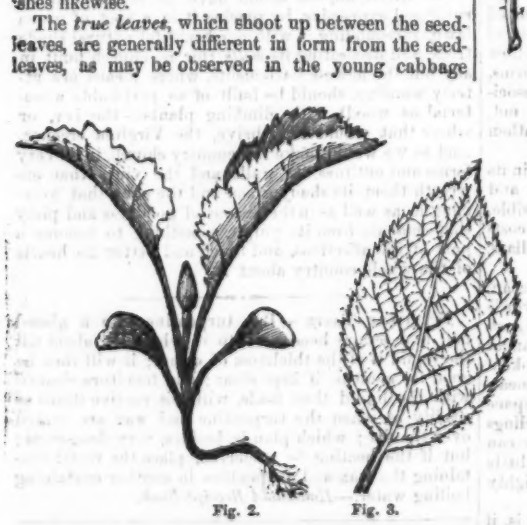

Fig. 2. Fig. 3.

At the base of every leaf is a *bud* (fig. 4), which contains either rudiments of leaves precisely similar to those described, or rudiments of flowers. Generally, only a portion of these come to perfection, most plants having, as it were, a reserve of these useful organs, to be called into life if required, and in trees they are carefully protected from cold in winter by scales, wool, or gum.

Fig. 4.

When the plant has gained size and strength, it is enabled to produce a new organ yet more delicate and complex than the leaf; this is the *flower* or *blossom*. A perfect flower in its natural state consists of a green cup or *calyx*, the leaves of which, if there be more than one, are called *sepals*; the *corolla*, the colored leaves of which are called *petals*; *stamens* and *pistils*.

Fig. 5.

Fig. 6.

The beauty of the flower mainly depends on the perfection of the corolla; the production of seed depends exclusively on the presence of stamens and pistils. The art of the florist consists in increasing the number, size, regularity, and bright tints of the petals.

In the rose (fig. 5) the *calyx* consists of five *sepals*, which remain attached to the plant after the petals have fallen off; the primrose has a calyx of one leaf, divided into five *segments* (fig. 6); the tulip has no calyx.

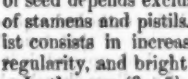

Fig. 7.

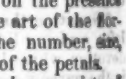

Fig. 8.

The *corolla* of the poppy consists of five *petals* (fig. 7); that of the primrose has but one, which is divided into five *segments* (fig. 8); and some plants

have no corolla, but these are rarely cultivated by gardeners.

A *stamen* consists of three parts; the *filament*, which is a thread of tubes for conveying nourishment to the other parts; the *anther*, a case usually of two cells, which, when ripe, burst and shed a quantity of fine powder, called *pollen* or *farina* (fig. 9). The honeysuckle contains five such stamens; the poppy a countless number.

Fig. 9.

The place of the *pistil*, or, if there be more than one of the *pistils*, is in the very center of the flower. Its summit is called the *stigma*, and its lower part the *germen*, and these are generally separated from one another by a third part, called the *style*. In the primrose, the stigma is globular (fig. 10) and the style long; in the poppy the stigma is radiated, and there is no style (fig. 11). The germen contains the rudiments of the *seed*, and when enlarged is usually called the *seed-vessel* or *fruit*. No flower can produce perfect fruit unless some portion of pollen fall on the stigma; therefore, few *double flowers*—that is to say, flowers in which the stamens and pistils have been changed by excessive cultivation into petals, produce seeds. In the case of dahlias, China asters, &c., there would seem to be an exception to this law; but it is only an apparent one; for what is called a single dahlia or a single China aster, is not in reality one flower, but an assemblage of small flowers or *florets*, of which the yellow central ones are furnished with stamens and pistils, and the spreading, petal-like ones are furnished with pistils only. Consequently, when the central florets are changed into spreading florets, they still continue to have pistils, and are capable of producing seeds, provided that pollen, either from the same flower, or from another flower of the same kind, falls on them. But in the case of a double stock or wall-flower, both stamens and pistils are wanting; these flowers, therefore, are always barren.

Fig. 10.

Fig. 11.

This is as much as is necessary for you to know at present about the structure of a plant, but if you desire to become a good gardener, it will be necessary for you to make the science of Botany your study; and you will find that every new discovery in one science throws light on the other.

MAXIMS.—Grow nothing carelessly; whatever is worth growing at all, is worth growing well.

Many kinds of garden seeds lose their vegetative power, if kept over the first year; be sure, therefore, to sow none but new seeds.

Melons, cucumbers, and other plants of the gourd tribe, form an exception to this rule; their seeds should not be sown until they are several years old, for they will then produce plants with scanty foliage but abundant fruit.

The seeds of most weeds will retain their vegetative power for an unlimited number of years; take care therefore, that all weeds are destroyed as soon as they appear, so that they may not ripen their seeds.

LOVE OF FAME.—The love of fame not regulated by principle, is more dangerous to the welfare of society, than the love of money.

FACT NOTICED RESPECTING BULBOUS ROOTS.—The *Magazine of Horticulture* says:—"What is in common language termed a bulbous root, is by LINNÆUS termed the hybernacle, or winter lodge of a young plant. The bulbs in every respect resemble buds, except in being produced under-ground, and include the leaves and flower in miniature which are to be expanded in the ensuing spring. By cautiously cutting (in the early spring) through the concentric coats of a tulip root longitudinally from the top to the base, and taking them off successively, the whole flower of the next summer's tulip is beautifully seen by the naked eye, with its petals, pistil and stamen. The flower exists in other bulbs in the same manner; but the individual flowers of others being less, they are not so easily detected, or so conspicuous to the naked eye. In the buds of the *Daphne mezereon*, and in those of the *Hepatica*, and at the base of the *Osmunda lunaria* a perfect plant of the future year may be found, complete in all its parts."

FARMERS SHOULD BE READING MEN.—Boys, you who intend to be farmers, hear what the Rev. J. A. NASH says:

"Science—we do not mean hard names, but truth as developed in nature—claims and should receive your attention. We insist upon it that the farmer should be a scientific man. A little reading, in connection with the extensive observation his employment favors, would make him such. Agriculture itself is the grandest noblest, and most useful of sciences. The loftiest intellects in the world are this moment engaged upon it, are delving deep for its hidden truths, and will yet bring them out for the benefit of mankind. It is yours to practice it, but study it also. Read your agricultural papers with an earnestness next after that with which you read your Bible. One may be a good farmer without being much of a man; or he may be the latter without being the former. We confess to a little ambition;—we should want to be both. If we had a son leaving us for this employment, we would say *don't be an unintelligent farmer*. After counselling him on the higher obligations of a reasonable being, we would say, putting the least important first, make your farm a *model farm*, and yourself a MODEL MAN; and we would say, you cannot do it without reading; and past education, however good, can not, must not be relied upon."

HINTS.—When I see a man hanging around the store, shop, or tavern, or loitering about home, because he has nothing to do, I am apt to think he likes company better than work, and is unwilling to work for what he can earn; that he promises to work for more persons at a time than would be best, and that he could find those in his neighborhood who would be glad to hire him to work in order to obtain their just demands. I am apt to think, too, that he owes for some pig, bushel of corn, a few pounds of pork, house rent, or some other necessary, which on quarter-day will look rather squally. But I am apt also to think if he becomes punctual in paying these little debts, faithful in his business, not extortionary in his wages, punctual in all his promises, and rendering himself useful to his employers to the best of his abilities, that he would be apt to find his business on the increase, wages improving, *less sauntering*, a firm demand for his labor, an increase in his pocket, a sweeter nap at night, a pleasanter wife, and withal—and what is best of all—a clear conscience.

Editor's Table.

THE GENESEE FARMER FOR 1856.—The first number for the new year, dear reader, is before you, and we think it will not only compare favorably with any previous issue of this old and favorite journal, but with any agricultural publication in Europe or America. With additional editorial assistance, and the best our country affords, with increased experience, and every necessary facility for making a National Agricultural Journal of which every intelligent agriculturist may be proud, we appeal to our friends everywhere to aid us in extending our circulation. Every one has friends and neighbors who would be benefitted by taking the *Genesee Farmer*,—and they would cheerfully do it if solicited. Let every subscriber consider himself an agent, authorized to form clubs and extend the circulation and usefulness of the *Genesee Farmer* as far as in his power. Hundreds are doing so now, and to them we are under great obligations. Let still others take hold of this work.

Those who have sent 50 cents for a single copy, can send $1.50 more for a *club of five*, or $2.50 more for a club of *eight*. Those who have sent $2.00 for a club of *five*, can send $1 more and increase the club to *eight*, and be entitled to a copy of the *Rural Annual* for getting up the club.

Look at the *Premium List* for 1856, and see what liberal offers we make our agents.

UNITED STATES AGRICULTURAL SOCIETY.—We have received the following circular from the President of this society:

"The Fourth Annual Meeting of the United States Agricultural Society will be held at Washington, D. C., on Wednesday, January 9, 1856.

"Business of importance will come before the meeting. Reports from its officers will be submitted, and a new election be made, in which it is desirable that every State and Territory should be represented.

"Lectures and interesting discussions are expected on subjects pertaining to the objects of the association, by distinguished scientific and practical agriculturists. The *Transactions* of 1855, containing a full account of the late Exhibition at Boston, will be distributed to such members as are present.

"The various Agricultural Societies of the country are respectfully requested to send delegates to this meeting; and all gentlemen who are interested in the welfare of American Agriculture, who would promote a more cordial spirit of intercourse between the different sections of our land, and who would elevate this most important pursuit to a position of greater usefulness and honor, are also invited to be present on this occasion.

"MARSHALL P. WILDER, President.

"W. S. KING, Secretary."

REAPING MACHINES.—The whole number of reaping and mowing machines estimated to have been sold in the United States during the past season is upwards of fifteen thousand, possessing a value of two millions of dollars.

IT is estimated that the farmers of Jefferson county, N. Y., made in 1854 three million pounds of butter and the same amount of cheese.

PROFESSOR JOHNSTON.—In view of the great loss which has befallen the agricultural world in the decease of the late Professor Johnston, of England, we think that at this time the following extract from an article in the November number of *Blackwood's Edinburgh Magazine* will prove particularly interesting to our readers who have for many years been acquainted with his numerous and valuable writings on scientific and practical agriculture.

"Death has struck a bright name from the roll of Science, by removing from us Professor JOHNSTON, of Durham. It is no exaggeration to say that the death of this eminent writer is a national loss; for by it the country has been bereft of one who has done more than has ever yet been done to preach science to the masses, and to set its laws, discovered in the laboratory, a-working in our fields and factories. The professional pursuit of science has two phases. One of these consists in the discovery of occult laws of nature, and the detection of valuable properties in matter; the other consists in publicly setting forth these discoveries in such a way that they become known and appreciated by the masses, and, being applied in the arts of life, prove a permanent addition to the comforts and resources of mankind. Distinguished in the first of these departments of science, Professor JOHNSTON was without an equal in the second. Though not devoid of high speculative power, his love of the useful, and his eminently practical turn of thought, attracted him ever to subjects of national importance. To the farmers especially, struggling with the competition of foreign grain, his science did good service; and if our fields are now greener, our crops heavier, and our stock fatter, we owe somewhat of this great boon to him. To convert the truths of science into tangible results,—that was his chief aim,—and who ever succeeded so well in it as he? Untiring industry and a prescient tenacity of purpose marked his career. Conscious of good talents, and of a strong natural predilection for scientific pursuits, the development of this aim of his life, though at times moving but slowly, or even to appearance standing still, was ever uppermost in his thoughts. While he taught as a tutor, or trained as a schoolmaster, the aim of his life was still present to him,—still quietly and resolutely worked after, and in due time it came. He broke from the obscurity of his little-noticed noviciate into a reputation which is more than European. And now, when he had reached the zenith of his powers—when the fruits of long years of patient and admirably directed study were being so attractively developed, he has passed away, leaving the traces of his matchless handiwork in many a department of applied science, but with no one for the present to take up his mantle.

"To such regrets at the loss which science has sustained by the death of Professor JOHNSTON, we must add others of a personal character. Not seldom has the Professor's graphic and ever-interesting pen contributed to this magazine: and his untimely death recalls vividly to mind a tribute which he paid to a fellow-worker in science, cut off in circumstances very analogous to his own. Two years ago, when alluding to a work of Dr. PEREIRA's, he spoke of its author in the following touching and most generous terms, than which none fitter can now be used in regard to himself:—'Snatched suddenly from the midst of his labors, there are few in any way familiar with the subject who will not regret the extinction of so much learning, and, apart from all private considerations, that the world should have so prematurely lost the benefits of his ripening judgment and experience, and the result of his extended reading and research. Yet how many precious cabinets of collected knowledge do we see thus hurriedly sealed up forever! How often, when a man appears to have reached that condition of mental culture and accumulated information, in which he is fitted to do the most for the advancement of learning, or for promoting the material comfort of his fellows—how often does the cold hand suddenly and mysteriously paralyse and stop him! He has been permitted to add only a small burden of earth to the rising mound of intellectual elevation—scarcely enough to signify to after-comers that *his* hand has labored at the work. Nevertheless, he may have shown a new way of advancing, so that to others the toil is easier and the progress faster, because he has gone before.'"

A good Turnip Crop.—The Biggar (Scotland) Farmers' Club recently awarded a silver cup to Mr. William Gibson, of Overburns, Lamington, Scotland, for the Largest Crop of Turnips on Five Acres in One Field. A portion of the field with *White Globe* turnips produced 48 tons 18 cwt. (gross) per Scotch acre, which, we believe, is about one-fifth larger than the English acre. The other portion of the field was sown with the *Green Top Yellow* variety, and produced 23 tons 4 cwt. per Scotch acre. On another farm entered for competition, this latter variety yielded 38 tons 5 cwt. per acre. In the former case the land was manured with 20 yards dung and 3 cwt. Peruvian guano per acre; and in the latter with 15 yards of dung, 2 cwt. Peruvian guano, and 2 cwt. superphosphate of lime per acre. The turnips were sown in drills 30 inches apart, and hoed out in the rows about 11 inches apart.

Another large Corn Crop.—The *Germantown Telegraph* contains an account of a crop of corn raised the past year by J. and E. Thornton, of Byberry, Penn., one acre of which, by actual admeasurement yielded *one hundred and two bushels and twenty-one quarts of well-cleaned corn.*

"The field contained nine acres, timothy sod, had been mowed three times; there were sixty ox-cart loads of barn-yard manure spread on the field in the fall—plowed from the 5th to the 15th of April six inches deep, rolled and well harrowed. The corn was planted in the first week of May, in rows four and half feet wide and two feet apart in rows, three grains in each hill, afterwards thinned down to two stalks; a gill of ashes, unleached, was applied to each hill at the time of planting. The corn was worked with cultivator and plow *one way*."

A Great Grain Warehouse.—It appears to be admitted that Chicago is the greatest grain market in the world; the daily receipts of grain being estimated at 111,000 bushels. The following account of a grain warehouse in that city gives some idea of the magnificent scale on which the grain business is conducted in Chicago:

"The building is 80 feet by 180, and capable of storing 100,000 bushels. The receipts of grain per day amounted to 40,000 bushels, from boats, railroads, and teams. By means of elevators, 5,000 bushels can be discharged from the vessel and stored in two hours and a half. A vessel can be loaded from the storehouse with 15,000 bushels of wheat or corn in three hours. Railroad cars can be discharged and the grain stored in fifteen minutes each."

Farmers' Reading Rooms.—By a notice in our advertising columns it will be seen that Saxton & Co, New York, have established a "Farmers' Reading Room" at 140 Fulton street, furnished with all the agricultural and horticultural journals of the United States and Europe, the free use of which they offer to all their friends. An opportunity is here offered to agriculturists visiting the city to pass an hour with pleasure and profit such as is seldom enjoyed, and of which they should not fail to avail themselves.

Great Wheat Crop.—California farmers either raise extraordinary crops or tell extraordinary stories. Witness the following:—The San Jose Telegraph says that Mr. Marshall, living near Reed's Mills, adjoining San Jose, raised 87 bushels of wheat to the acre. Another California paper mentions another wheat crop in that State which, on the whole crop, averaged over 60 bushels to the acre the present season.

Bound Volumes.—The volumes of the *Genesee Farmer* from 1847 to the present time, half-bound in sheep, for sale at this office at 62½ cents per volume.

To those who form Clubs for 1856.—We do not ask that all the members of a club should receive their papers at one office. We are willing to send to as many Post Offices as there are members of the club, if necessary for the convenience of subscribers. But where it is practicable, Post Masters would accommodate us by keeping a list of the subscribers at their office, and allowing us to send the whole number to their own address. This saves us the trouble of writing on all the papers. Many have done this the present year.

Our friends ordering the *Farmer* will be particular in giving the names of the Post Office, County, and State; also in writing names plain, as by this much perplexity may be avoided to ourselves and subscribers.

Agricultural Books and Libraries.—We refer all to our offer of Agricultural Books. We know of no better way in which a young man could obtain a few good Agricultural Books than by obtaining subscribers to the Genesee Farmer. The fall and winter months afford leisure, and the price of the Farmer is so low and its merits so well appreciated, that few will refuse to subscribe if solicited. We will send specimen numbers and showbills to all who apply.

The Rural Annual and Horticultural Directory for 1856.—Copies of this work will be sent by mail free of postage to any one remitting to this office the price of the book—paper cover, 25 cents: cloth, 50 cents.

To our Canadian Friends.—We shall continue to furnish the Farmer to our Canadian subscribers free of American postage.

Salt.—The quantity of salt manufactured the present season at the Onondaga Salt Works, at Syracuse, N. Y., is about *six millions of bushels*. The average price is about $1.40 per barrel, making the whole crop worth $1,600,000.

Notices of New Books, Periodicals, &c.

Instruction for the Analysis of Soils, Limestone, and Manures. By Jas. F. W. Johnston. Cleveland, Ohio: S. B. Shaw.

We have received this manual from the publisher, and cannot better inform our readers in regard to it than to quote the following from the author's preface:—"This little work is not intended to compete with treatises on chemical analysis, such as those of Rose and Fresenius, which are the text books of the accomplished analyst. Originally published as an appendix to my lectures on agricultural chemistry and geology, it has been much in demand also in a separate form. I have, therefore, given to this third edition a more widely practical bearing, by including limestone, clays, ironstones, manures, and natural waters among the substances to be analyzed. * * * To the schoolmaster, the farmer, the pharmaceutical chemist, and druggist, the youthful student, to the rural, the training, or normal school, and the agricultural laboratory I offer it as a first help to practical and economical chemical analysis." To commend it would be superfluous.

Transactions of the New Hampshire Agricultural Society for 1854.

A copy of the above work was received so late before going to press that we are unable to give it a satisfactory examination. The appearance of the volume is very creditable, and judging from the titles of some of its essays, we should think it contained much valuable matter, but will defer further notice until a future number

VILLAGE AND FARM COTTAGES. The requirements of American Village Houses considered and suggested, with designs for such Houses of moderate cost. By H. W. CLEAVELAND, WM. BACKUS, and SAMUEL D. BACKUS. New York: D. APPLETON & Co.

From a limited examination of this work we deem it a valuable acquisition to the community at large, and especially to those intending to build, with moderate means, but at the same time desirous of combining in their structures taste and convenience. The designs here furnished are for buildings varying in cost from $575 to $3,000. The engravings in the volume are elegant, and the whole work is executed in that high style of art which characterizes everything emanating from the press of its celebrated publishers. For sale in this city by D. M. DEWEY.

APPLETON'S CYCLOPÆDIA OF BIOGRAPHY, Foreign and American. Embracing a Series of Original Memoirs of the most distinguished persons of all times. Edited by FRANCIS D. HAWKS, D. D. With numerous Illustrations. New York: D. APPLETON & Co.

We have received a specimen sheet of this work, and if we may be allowed to judge of what the whole will be from the pages before us, we will say without hesitation that it will be one of the most valuable works of the kind ever published in the English language, and will soon become a standard for reference. The execution is admirable.

THE YEAR BOOK OF AGRICULTURE: or, The Annual of Agricultural Progress and Discovery, for 1855 and 1856. Exhibiting the most important Discoveries and Improvements in Agricultural Mechanics, Agricultural Chemistry, Agricultural and Horticultural Botany, Agricultural and Economic Geology, Agricultural Zoology, Meteorology, etc. Illustrated with numerous engravings. By DAVID A. WELLS, A. M. Philadelphia: CHILDS & PETERSON.

This work, which is principally compiled from the standard agricultural and horticultural journals of this country and Great Britain, contains in a small compass a mass of information exceedingly valuable to all engaged or interested in rural affairs. For sale by E. DARROW & BRO., of this city.

UNCLE JOHN'S FIRST and UNCLE JOHN'S SECOND BOOK. Price, 31¼ and 37½ cents.

These are two little gems for children learning to read. The lessons are skillfully graduated from the very simplest to those that are more difficult. The matter is entertaining and instractive, and illustrated by a great number of beautiful engravings; they are handsomely bound, and are just the articles for Christmas presents to the little ones. Published by D. APPLETON & Co., Broadway, New York and for sale by D. M. DEWEY, Rochester.

MEXICO AND ITS RELIGION. With Engravings. By R. A. WILSON. New York: HARPER & BROTHER.

The above is an interesting work from one whose extensive acquaintance with the subjects of which he writes enables him to treat them in a superior manner; and from a hasty perusal of its pages we should think that its merits would successfully advocate its claims to popular favor.

ROSE CLARK. By FANNY FERN. New York: MASON & BROTHERS. 417 pages. Price, $1.25.

An extremely interesting work, and equal to any of the other productions from the pen of its talented and celebrated authoress. For sale in this city by D. M. DEWEY.

OUT OF DEBT OUT OF DANGER. By COUSIN ALICE. Price 75 cts.

A charming story for young people, finely written, and inculcating an excellent maxim. Published by D. APPLETON & Co., Broadway, New York, and for sale by D. M. DEWEY, Rochester.

PRACTICAL COOKERY AND DOMESTIC ECONOMY. By Miss HALL. New York and Auburn: MILLER, ORTON & MULLIGAN.

A book of 436 pages, containing a host of recipes. For sale by D. M. DEWEY, Rochester.

WANZER, McKIM & Co., Publishers, Buffalo, N. Y., announce the forthcoming of a new work, entitled "The Sacred Plains," by J. H. HEADLEY. It will be published in one volume, 12mo., cloth, and will be elegantly illustrated. In their circular they say:—"The author has strictly adhered to sacred history and geographical accuracy in fixing his facts, and he has greatly added to the interest of the volume in having woven in an amount of interesting matter and entertaining detail concerning the various scenes, which cannot fail to engage the earnest attention of the reader."

HENRIETTA ROBINSON. By D. WILSON. New York and Auburn: MILLER ORTON & MULLIGAN. For sale in this city by D. M. DEWEY

This is a well written account of those acts which have caused the unfortunate subject of this volume, under the above fictitious name, to acquire that unenviable notoriety in this country which she now possesses.

THE REFUGEE: or, the Narratives of Fugitive Slaves in Canada. Related by themselves; with an account of the history and condition of the colored population of Upper Canada. By BENJAMIN DREW. Boston: JOHN P. JEWETT & Co. 1856. 399 pages.

For sale by D. M. DEWEY, Rochester.

THE MYSTERIOUS STORY BOOK: or, The Good Step-Mother. By Whom? Price, 75 cents.

This is another well written book for the young, illustrated with a number of elegant engravings. Published by D. APPLETON & Co., Broadway, New York, and for sale by D. M. DEWEY, Rochester.

Inquiries and Answers.

E. L.—*Toronto, Iowa.* The Messrs. FOWLER & WELLS, New York City, advertise for sale a Hand-Mill that will grind wheat or corn for family use. Do not know the price. By addressing them you will obtain full particulars.

I HAVE waited some time in hopes of seeing some notice of a disease—blight or whatever it may be called—that appeared in this town the last summer and affected the plum trees. In August I noticed the leaves were dropping off my plum trees, and on examining them found the leaves were eaten on the under side and some small holes pierced through, and there were small black worms on the leaves from one-sixteenth to one-fourth of an inch in length. Nearly all the plum trees were similarly affected, some, however, more than others; the plums did not ripen, remained sour, and finally dropped off. Some of my trees put out new leaves in September. I should like to be informed whether this is a solitary case, and if there is any remedy or preventive. WM. H. HYDER—*Hebron, Pa.*

The black worm is no doubt the slug worm *(Tenthredo or Selandria cerasi)* which destroys the leaves of the cherry and of the pear, and frequently infests the plum. It is easily killed by dusting ashes or lime over the tree when the dew is on; if once does not suffice, the operation should be repeated until the foe is destroyed. Of course it was impossible for the fruit to ripen when the trees were divested of their foliage.

CULTIVATION OF BARLEY.—I should like to be informed through the medium of the *Genesee Farmer* the most suitable soil for raising barley. I have a few acres of newly cleared land which is too wet for winter wheat, and spring wheat grows too rank to fill well. Subsoil is clay, with a slight surface of vegetable mold. The cultivation of barley has received but little if any attention in this section of the country, and any information you can give will be thankfully received by your patrons in this vicinity. H. C. EL-*Richfield, Ohio.*

Will some of our correspondents give us their experience on this subject?

PREMIUMS FOR 1856!

We ask the attention of our friends everywhere to the *Premiums* we offer for the coming year. There is no better way to procure good agricultural reading than by obtaining subscribers for the *Genesee Farmer*.

1. To every person who sends us a club of eight subscribers at our regular terms, *(three shillings each)* we will give one copy of the *Rural Annual* for his trouble.

2. To every person who sends us SIXTEEN subscribers at our club terms of *three shillings each*, one extra copy of the *Farmer* and one copy of the *Rural Annual*.

3. To every person sending us TWENTY-FOUR subscribers, as above, two copies of the *Rural Annual*, and one extra copy of the *Farmer*, or, any agricultural work valued at 50 cents, *postage paid*.

4. To any person ordering THIRTY-TWO copies of the Farmer, three copies of the *Rural Annual* and one extra copy of the *Farmer*, or, any agricultural book valued at 75 cents, *postage paid*.

5. For FORTY, four copies of the *Rural Annual* and one extra copy of the *Farmer*, or, any agricultural book valued at $1, *postage paid*, or, four extra copies of the *Farmer*.

6. For FORTY-EIGHT, five copies of the *Rural Annual* and one extra copy of the *Farmer*, or, any agricultural book valued at $1.25, *postage paid*, or, five extra copies of the *Farmer*.

For larger numbers, books or papers given in the same proportion.

☞ To save expense to our friends, we pay the postage on all these works, and persons entitled will state what they wish sent, and make their selections when they send orders; or if their list is not complete, if wished, we will delay sending until the club is full.

Premiums for the Greatest Number of Subscribers.

In order to excite a little competition among our friends everywhere, as well as to reward them for their voluntary labors in behalf of our journal, we make the following liberal offer. Those who do not get the premiums offered below are sure of the above, so that we have no blanks.

1. FIFTY DOLLARS, in Agricultural Books, to the person who shall send us the largest number of subscribers, at the club prices, before the 15th day of April next, so that we may announce the successful competitors in the May number.

2. THIRTY DOLLARS, in Agricultural Books, to the person who shall send us the second highest list, as above.

3. TEN DOLLARS, in Agricultural Books, to the person who shall send us the third highest list, as above.

Our object in offering books is to increase their circulation throughout the country. Those who prefer nursery trees, plants, &c., can be accommodated; and if any prefer the money, we will make arrangements accordingly.

Clubs are not required to be at one post office or sent to one address. We send wherever the members of the club may desire.

THE RURAL ANNUAL AND HORTICULTURAL DIRECTORY.—We have just published a very neat little book of 120 pages with the above title. It is devoted to the *Orchard*, the *Vineyard*, and the *Flower Garden and Lawn*: and we shall only express the opinion of all who have seen it, when we say that it is the best little work yet published on the subjects of which it so plainly and carefully treats. Anxious to make the circulation of this useful little work as general as possible, we make the following proposition, to those who form clubs for the *Geneseo Farmer:* FOR FOUR DOLLARS we will send *eight copies* of the *Geneseo Farmer* and *eight copies* of the *Rural Annual*. FOR EIGHT DOLLARS we will send *sixteen copies* of the *Geneseo Farmer* and *sixteen copies* of the *Rural Annual*, and one extra copy of each for the person who gets up the club.

Any person sending us $3 for a club of eight of the *Genesee Farmer* shall receive one copy of the *Rural Annual* for his trouble.

The Practical and Scientific Farmer's Own Paper.

THE GENESEE FARMER,

A MONTHLY JOURNAL OF

AGRICULTURE AND HORTICULTURE,

ILLUSTRATED WITH NUMEROUS ENGRAVINGS OF

Farm Buildings, Animals, Implements, Fruits, &c.

VOLUME XVII. FOR 1856.

In issuing a prospectus for the Seventeenth Volume of the Genesee Farmer, the publisher flatters himself that it is too widely known, too extensively circulated, and too well read to render it necessary to state at length the design of the work. Those who read the Farmer are the best judges of its value, and those unacquainted with it are requested to examine its pages. He will only say that for the year 1856 he will furnish a paper that for size, beauty, and ability, will not be excelled in this country.

The new volume will commence on the first of January, and will be printed on NEW TYPE and SUPERIOR PAPER, and each number will contain about ONE-THIRD more reading than at present. Each monthly number will consist of THIRTY-TWO large pages, making a volume of 384 pages, with several hundred engravings, (with title page, index, &c., suitable for binding), at the close of the year. No one would sell the volume at the end of the year for its cost.

Our illustrations are NUMEROUS, APPROPRIATE, and EXPENSIVE, consisting of Farm Buildings, Improved Implements, Domestic Animals, Choice Fruits, Flowers, Shrubs, &c., &c.

We number among our Contributors hundreds of the best practical Farmers in the country, and our readers have through our pages, the benefit of their wisdom and experience. No thinking man can read any number we issue, without receiving some useful hint in regard to the management of Crops, Stock, or the Orchard, of more value than the price of the volume. Our large circulation enables us to furnish a paper for three or four shillings equal, at least, to the best in the country for value and beauty.

An earnest advocate of improvement of both the MIND and the SOIL, the FARMER seeks to advance the rural interests of the country, and elevate the profession of Agriculture to its proper position. To accomplish this, it has labored long and faithfully, and not without some success. It is one of the oldest, and its position as the CHEAPEST, and at least one of the BEST AGRICULTURAL JOURNALS in the country is fully established, and we confidently ask for it that support which it merits from the Farmers, Gardeners, and Fruit Culturists of the United States. We invite all who feel the importance of sustaining this work, and extending its usefulness, not only to subscribe themselves, but to introduce it to the patronage of their friends.

Fifty Cents a Year, in Advance.

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Subscription money, if properly enclosed, may be sent (post-paid or free) at the risk of the Publisher. Address

JAMES VICK,

November, 1855. *Rochester, New York.*

1856.

EVERYBODY SHOULD HAVE A COPY.

THE RURAL ANNUAL AND HORTICULTURAL DIRECTORY.

CONTAINING directions for the preparation of the ground for the *Orchard* and *Fruit Garden*, planting, pruning, etc. Also plain directions for making and planting the *Lawn and Flower Garden*, and a *Catalogue of Nurserymen* in the United States, Canada, and Europe, etc. *Illustrated with Sixty Engravings.*

SYNOPSIS OF CONTENTS.

THE FRUIT GARDEN AND ORCHARD.

Preparation of the Ground.—Suitable Soils, Draining, Subsoiling, and Trenching, Manures, etc.

Directions for Planting, Pruning, etc.—Proper Season for Transplanting, Laying out the Ground, Distances at which Trees should be Set, Planting, Mulching, Pruning, Staking, etc.

Diseases.—Fire Blight, Leaf Blight, Black Knot on the Plum, Yellows in Peach Trees, Bursting of the Bark, or Gum on Cherry Trees, Mildew on the Peach, Curl of the Leaf in the Peach.

Insects Injurious to Fruit Trees.—Aphis, or Plant Louse, Woolly Aphis, or American Blight, Scaly Aphis, or Bark Louse, Apple Tree Borer, Apple Worm, Canker Worm, Caterpillars, Cherry or Pear Slug, Curculio, Moths, Peach Tree Borer, Rose Bug, Leaf Rollers.

Animals Injurious to Fruit Trees.—Birds, Field Mice, Moles, Cats, Hogs, etc.

Dwarf Trees for the Garden.

List of Fruits Recommended by State Societies.

List of Fruits Recommended by the American Pomological Society.

THE VINEYARD.

Soil and Position, Preparation of the Soil, Laying off, Planting Treatment, Pruning and Training, Budding out and Pinching.

THE LAWN AND FLOWER GARDEN.

Preparing the Soil and Laying out the Garden.

Planting the Lawn and Garden.—Deciduous Trees, Evergreen Trees, Shrubs, Roses, Bedding Plants, etc.

LIST OF NURSERYMEN IN THE UNITED STATES, CANADA, AND EUROPE.

Published at the office of the *Genesee Farmer*, by JAMES VICK. For sale at retail, paper covers, 25 cents; cloth covers, 50 cents. Wholesale, paper covers, $2 per doz.; $12.50 per hundred; $60 for 500; cloth, $4 per dozen.

ADVERTISEMENTS,

To secure insertion in the FARMER, must be received as early as the 10th of the previous month, and be of such a character as to be of interest to farmers. TERMS—Two Dollars for every hundred words, each insertion, PAID IN ADVANCE.

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THE place is known as "Ryerson's Island," and contains 191 acres per deed—is situated about one mile east of Long Point, in Lake Erie, and about eight or ten miles from Port Rowan and Normandale in Norfolk county.

The soil is very rich. Corn, cabbage, tomatoes, potatoes, and almost all vegetation is of the most luxuriant growth, and can be in market nearly three weeks before the same are produced on the main land. A small portion is under cultivation. It offers great advantages for raising Cows, Oxen, Sheep, and all kinds of Stock, as an extensive Grazing or Market Farm. Twenty to thirty or forty tons of excellent hay can be had just by cutting and curing. Wild *Grapes* are very abundant and large. Every spring and fall it ABOUNDS with WILD FOWL—Wild Ducks innumerable, of almost every variety—(one gentleman shot and bagged 86 in part of one day last year)—Geese, some Swans, Plovers in flocks, Woodcocks, Pigeons, etc., all summer. Turtles of different kinds and size are very plentiful. Deer, Coons, Muskrats, etc., are in great numbers on Long Point. The FISHING ADVANTAGES ARE STILL GREATER, either with hook and line, nets, or otherwise. The fish are caught in *great quantities*, and are very large and fine. The delicious Muscalunge, weighing from 30 to 40 pounds; the Sturgeon, from 75 to 100 pounds; the Cat and White fish, and Herring are very plentiful. The PLEASURE BOAT is a great luxury here, being just far enough from the main shore not to be annoyed. It can be made a superior place of PUBLIC RESORT, being known to large numbers of sporting gents, all along from New Orleans, Canada, New York, etc. *It is very* HEALTHY, and can be reached from different points along the lake by Steamboat, which leaves Buffalo in the evening, and arrives early next morning; there are also Railroad advantages approaching. Terms very reasonable. Apply to

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Jan.—4t. Normandale P. O., Canada West.

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WE would particularly invite the attention of those societies who are about to make up their PREMIUM LISTS FOR 1856 to our large collection of Agricultural Books, which are peculiarly adapted for premiums.

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The above will be sent free upon receipt of price annexed.

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A farm of 282 acres, four miles south-west of Geneva, Ontario county, near the Geneva and Rushville plank road, and about three miles from the Gorham station of the Canandaigua and Elmira railroad, will be sold for the low price of *fifty dollars* per acre, to close up an estate. It is situated in one of the most beautiful and fertile sections of Western New York. The farm is under excellent cultivation, well fenced and with good buildings, and has 80 acres of woodland. It will be divided into two farms if desired. Terms easy and title perfect. For further particulars enquire of D. D. Munn, at the office of the Rochester Daily American, E. H. Hurd, Esq., Geneva, or C. S. Butler, on the premises. Jan.—tf

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JUST received by the brig Wave Spirit, direct from the Ichaboe Islands, a cargo of this superior Guano (which is the first cargo arrived since that brought by the ship Shakspeare, in 1845). This Guano is now landed in excellent order, and will be sold in lots to suit purchasers. Samples and analyses will be sent by addressing the agent. As the quantity is small, early application will be necessary. Farmers who cannot remove what they desire, may have it remain on storage until April 1st, at 18¾ cents per ton per month, which includes insurance.

Price, $40 per ton of 2,000 lbs.

A. LONGETT, Agent.

Nov.—tf 34 Cliff st., corner of Fulton, New York.

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THE SATURDAY EVENING POST.

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